

# KIAS ANNUAL REPORT

## 2004



Korea Institute for Advanced Study (KIAS)  
207-43 Cheongnyangni 2-dong, Dongdaemun-gu,  
Seoul, 130-722 Korea  
Tel: 82 2 958 3711 Fax: 82 2 958 3770



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# KIAS Annual Report 2004

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## REPORT OF PRESIDENT

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### *Report of President*

This is the year 2004 annual report on the Korea Institute for Advanced Study (KIAS) and is also my first report as President. KIAS was founded on October 1, 1996, with a strong commitment to the excellence in basic sciences, by the Ministry of Science and Technology of Korea. KIAS embarked on an ambitious journey with only three professors and three research fellows in mathematics and physics and at the time of inception, current Dean of Faculty, Professor Hyo Chul Myung was appointed Acting President. By the end of December 2004, I will have served as President for 6 months. Currently, KIAS research staff consists of 81 members, 30 in the School of Mathematics, 31 in the School of Physics, and 20 in the School of Computational Sciences with diverse nationalities. We have come a long way indeed. In this report we present the current status with an overview on the organization, research staff, alumni, visiting scholars, associate members, and scientific activities.

During last eight years, we have tried to build the best research facility in the region by providing a pleasant and free research environment for the scholars in home and abroad. In 2004, we have had more than 8,500 participants from domestic and abroad to attend 24 international meetings and 500 seminars in a variety of subjects, in which many world's leading scholars have participated. The Institute has no formal curriculum, degree programs, or experimental laboratories. Instead, the Institute is now home to 24 highly talented scientists and 70 young promising research fellows to accomplish and explore the most fundamental areas of science. We have an ambition to make the KIAS a truly international research institution.

One of our goals is the sustained creation of new knowledge driven by curiosity and to share the results with others. Some knowledge will become, as history indicates, the backbone of technology that our society needs, whereas some will become fundamental knowledge that human race can cherish as an intellectual triumph.

As our society as well as science has been undergoing drastic changes, another goal is to make KIAS relevant to our society. We are committed to providing a unique opportunity for the Korean science community to grow in intellectual capability by providing actively interacting research environment. Establishment of the School of Computational Sciences which engages in theoretical and computational research in the so-called information, bio-, and nano- sciences is such an example. At the same time, we are ready to embrace and nurture new ideas and perspectives in the future direction in basic science research. I am very proud of the flexibility that is the most important strength of the KIAS in this endeavor. In addition to the future growth in the Schools of Mathematics and Physics, we will aggressively continue to expand the School of Computational Sciences to accommodate the originally planned Schools of Chemistry and Biology.

As an effort to contribute to the nation-wide campaign to encourage young students to pursue the careers in science, we have also provided, in the past few years, mentoring programs for undergraduate and graduate students in Korea in the form of winter and summer schools in order to motivate them and to provide them with guidance in their future careers in science. We believe that this program has been very successful and plan to continue to expand the efforts.

Finally, I would like to thank, with my deepest gratitude, everyone who has taken part in building this proud institution and who has helped and worked so hard to make our dream come true.

Mahn Won Kim  
President

## REPORT OF PRESIDENT

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President of KIAS, Dr. Mahn Won Kim delivers a speech at the inauguration ceremony on July 1, 2004

## HISTORY

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### *History*

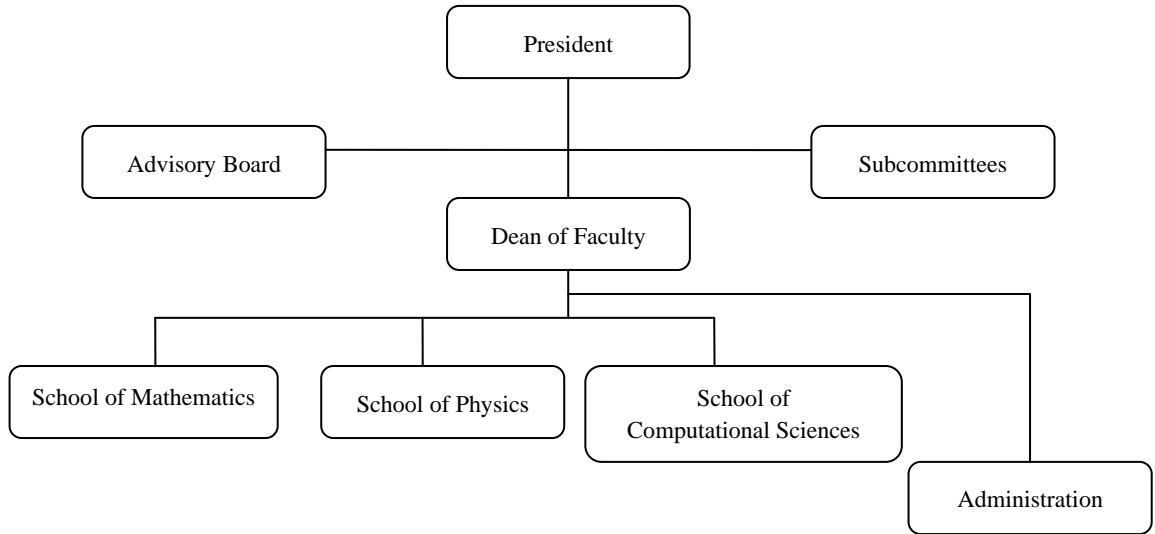
KIAS was inaugurated in October of 1996 under the support of the Korean government with strong commitment to the excellence of research in fundamental sciences (mathematics, physics, and computational sciences). Located on a 30-acre site in Hongneung, Seoul, Korea, KIAS provides a research-friendly atmosphere with a full access to state-of-the art research facilities.

1995	March	Feasibility study on the establishment of KIAS
	December	Establishment of KIAS approved at the Board of Trustees' Meeting KIAS Establishment Corps launched
1996	August	Prof. Efim I. Zelmanov of University of California at San Diego (1994 Fields Medalist) was appointed as Distinguished Professor at School of Mathematics
	October	KIAS established and inaugurated Prof. Hyo Chul Myung of KAIST was appointed as Vice President and Acting President
	November	School of Mathematics and School of Physics were established KIAS started with research staff of 1 Distinguished Professor, 2 Professors, and 3 Research Fellows
1997	December	Prof. Chung Wook Kim of the Johns Hopkins University was appointed as President
1998	December	Research staff of KIAS increased to 1 Distinguished Professor, 6 Professors, and 30 Research Fellows
1999	August	Prof. Leonard Susskind of Stanford University was appointed as Distinguished Professor at School of Physics
2000	September	School of Computational Sciences was established
2002	December	Research staff of KIAS consists of 2 Distinguished Professors, 15 Professors, and 47 Research Fellows
2003	June	Prof. Robert B. Laughlin of Stanford University (1998 Nobel Laureate in Physics) was appointed as KIAS Affiliate Distinguished Professor at School of Physics
	December	Research staff of KIAS consists of 2 Distinguished Professors, 19 Professors, and 61 Research Fellows
2004	July	Prof. Mahn Won Kim of KAIST was appointed as the third President
2004	December	Research staff of KIAS consists of 2 Distinguished Professors, 17 Professors, and 62 Research Fellows

## ORGANIZATION AND COMMITTEES

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### *Organization and Committees*



### *Administration*

Kim, Mahn Won  
Myung, Hyo Chul  
Shim, Moon Taik

*President*  
*Dean of Faculty*  
*General Manager*

Oh, Si -Hyoung  
Jung, Yo Chang  
Kim, Yoon Hee  
Kim, Young Eun  
Lee, Hyung Soon

*Team Leader/Planning*  
*General Affairs/Security*  
*Public & International Relations/Newsletter*  
*Personnel/Payroll*  
*Secretary of President*

Park, Cheol-kyoo  
Choi, Byung-ho  
Joo, Keehyoung  
Jung, Woo Joo  
Kim, So-Young  
Lee, Jung Eun  
Lee, Min-Sung  
Park, Sujin

*Team Leader*  
*Computing*  
*Computational Sciences Research Assistant*  
*Computing*  
*School of Mathematics*  
*School of Physics*  
*School of Computational Sciences*  
*Librarian*

Moon, Soon Ho  
Kwak, Seong- Cheol  
Kweon, Oh Beom  
Ryu, Neung Hyun  
Yang, Minwoo

*Team Leader/Budgeting*  
*Financial Management/Purchasing/ Contract*  
*Disbursements/Taxation*  
*Budgeting*  
*Budgeting*

## COMMENTS FROM KIAS VISITORS

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### *Comments from KIAS Visitors*

**Han, Chong Kyu**  
**Department of Mathematical Science**  
**Seoul National University**



Perhaps more than three decades, Korean mathematics community endeavored to have an institute for mathematical research. Korea has a short history of mathematical research: Before mid-1970's when young Korean mathematicians began to come back after obtaining doctoral degree from abroad, not much research took place in Korea, even though several Korean mathematicians at that time did very active mathematical research in the United States and Canada. The number of research mathematicians increased steadily since then so that in mid 1990's it seemed that creative research could have been generated within Korea.

Accordingly the Korean mathematics community urgently needed to establish a research center where mathematicians get together to share the ideas and informations in mathematical research. KIAS has played that role since it was established in 1996.

By visiting KIAS I received much benefit from seminars, workshops, discussions with established mathematicians and discussions with young scholars. But most of all, I enjoyed being free in this pleasant place from all duties other than research. I like the atmosphere of this institute.

KIAS workshops or symposiums keep me informed of trends and the newest results. I have participated in those meetings in the areas of complex geometry and analysis. Especially, I appreciate the 6th KSCV International Conference held in August of 2002. At that time it was difficult for my home institute, Seoul National University to host the conference because of limitation of budget and accommodations (guest houses).

The staff of KIAS seems to be proud of their institute. They are always helpful and ready to give fast services to visitors. Afternoon tea times are enjoyable. I wish that KIAS expands facilities to house more visitors and reaches its goal of becoming a research institute of a top level in the world.



## COMMENTS FROM KIAS VISITORS

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**Jong-Jean Kim**  
**Physics Department**  
**Korea Advanced Institute of Science and Technology**

[1]-(1) We, Koreans, have a culture that they are more concerned with others around than themselves. This strange culture seems to make every Korean never become free for ourselves, and always busy with things unexpected. We are almost fighting each other to pay for all the others in the group after eating out at the restaurants. Indeed, it is almost impossible for me to be alone to do my own business of writing a book for example. This wonderful place of KIAS is just the unique place in Korea where we can do our own works free from all the destructive interferences possible otherwise. I could really concentrate on writing a monograph book on Dipole Glass(Imperial College Press) and a chapter contribution to the Springer Series of Lecture Notes in Physics in time to meet the deadlines. Members of the Statistical Physics and Condensed Matter Physics were always ready to help me with core discussions and reference sources available, for which I am most thankful and appreciating.

[1]-(2) Very much satisfying infrastructures supporting the visitors. When we go for a sabbatical year, many problems other than “who are there” can be more important for more satisfying outcomes of mutual interests. When you go abroad for a sabbatical, you may get stuck wasting a lot of time to solve a housing problem, meals, etc. KIAS is well prepared within a token budget at least in terms of administrative secretarial assistance. Cafeteria people are there always waiting for more people to serve early breakfast till late dinner even on off-duty Saturdays with a warm Hello.

[1]-(3) For more ideal perfection the last minute responsibility of checking should be exercised, for example, whether bath room towels are there in proper locations, if the entrance door is locked, etc. I sometimes hear comments from foreign guests why many public clocks in Korea are showing different times and people do not care much for the different times. Space limitation seems to be a serious problem to be solved for better library services, for critical mass formations of cooperative research groups, faculty and guest housings, staff offices, etc. Without these minimal prestiges well qualified applicants will no longer be heading in competition to KIAS for both the best selected faculties and staff.

[2]. Seminars, symposiums, workshops, international conferences, and public colloquiums are all well organized with timely selections of subjects to draw quite a good size of audience from outside over the whole country, demonstrating the central role of KIAS in Korea in basic sciences. This KIAS is unique in Korea with secretarial staff of such a good proficiency in English conversation with foreign attendants and welcoming cares for free morning snacks 30 minutes before the first session. This is a good arrangement for graduate students to meet leading scientists and superb lecture speakers. Conference pictures, reception photos, tourist collections, etc. all available from the internet home page, may well add to valuable public relations of KIAS.

[3]. Korea Institute for Advanced Study (KIAS) is certainly the one and only place remaining, where the top best scientific talents can continue to do their very best to accomplish their life-time great works in basic sciences. Without this kind of basic science efforts in the country, Korea will always remain at best as a second-class commercial country with all kinds of dangerous, immoral, and anomalous side effects rooting into the national culture in the course of easy way of imitations for the frontier sciences and technology. KIAS must present and guide the direction where to go in

## COMMENTS FROM KIAS VISITORS

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the basic science for all the other Korean universities. For this purpose it is more effective for KIAS to form a massive frontier group rather than a few separate stars in the existing fields.

[4]. KIAS members may well be aware of the success or failure stories of many other world-wide frontier institutes of basic sciences. Cavendish Laboratory after the flourishing half century years of nuclear physics from Thomson and Rutherford era has been leading another 50 years in solid state physics, a hard decision by Mott. Santa Fe Institute was flourishing for some years in the beginning with the top-notch scientists creating a new field of Complexity Science. One reason for their failure is in the air that they did not care about experimental groups but only with purely theoretical works.



It is possible for any others to follow something in the second line but almost too difficult to create something in the leading edge of the first frontier line. KIAS has been successful to be admired in this first stage period of settlement to draw the top-notch Korean scientists in both professors and post-doctoral members, and firmly establish the unique environments for creative research works. However, this superior position can become unstable against jealous petitions from other university frogs inside their authority wells unless a public success story builds up in the 2nd stage of development by such a great achievement possible only from KIAS.

There will be a chain-reaction success at KIAS, when the world-wide basic science centers will envy to remodel their institutes after the KIAS success, if the government financial supports continue to comply with the challenges to be made in the 2nd stage period of development of together with national moral supports from other universities. KIAS is certainly the albatross of basic sciences in Korea.

## COMMENTS FROM KIAS VISITORS

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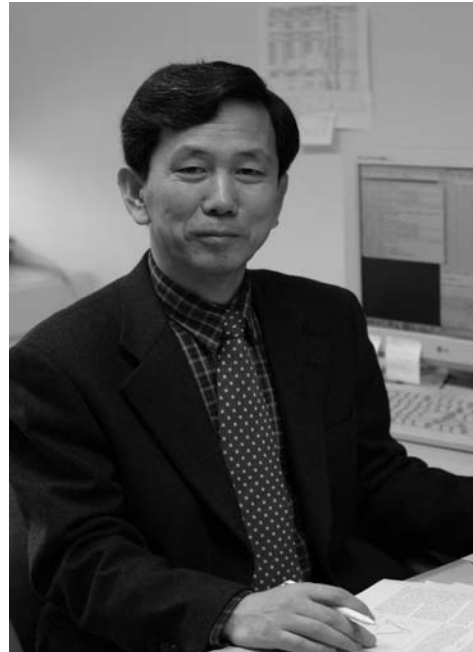
**Lee, Sang Bub**  
**Physics Education Department**  
**Kyungpook National University**

I have known Korea Institute for Advanced Study (KIAS) from the time of foundation, and KIAS has become closer to me since it became a center of statmech at the beginning of new millennium. In these days, scientists in statmech regularly visit KIAS to attend the monthly meeting. I am also one of the participants and was and will be a speaker at the meeting.

Since late 1980's, few members in the society of statmech got together at Korea University and exchanged their research interests. This research group was named DSRG, abbreviated from Disordered System Research Group. Originally this group had only four active members, Professor Inmook Kim at Korea University, Professor Yup Kim at Kyunghee University, and Professor Hae Yong Park (deceased) at Soongsil University, and myself. Later, many new professors studied abroad joined the group, including Professor Byungnam Kahng, Professor Jin Min Kim, Doctor Jysoo Lee, and Professor Hyunggyu Park, and many more in these days. Since Professor Hyunggyu Park joined the faculty of KIAS from Inha University, the monthly meeting of DSRG moved to KIAS, with the regular meeting opening to more general topics in statmech. This new place since then became a center of the statistical mechanics.

During the last more than one and half a decade, I have worked on self-avoiding random walks, transport in disordered media, continuum percolation, and molecular beam epitaxy. However, due to rapidly varying interest in the community of statmech, I

wished to learn a new, more demanded topic. Biophysics particularly related with Genetic Engineering was what I decided to work on. Since the only institution where this topic is currently on researching by physicist was the School of Computational Science at KIAS, I contacted Professor Jooyoung Lee and expressed my research interest in protein folding in October, 2003. I have known him since he returned from US to join the faculty of KIAS but never talked about my research interest. Late 2003, I joined KIAS as an associate member and visited this place during winter and summer vacations.



As I realized that KIAS has excellent research facilities with quiet environment as well as excellent programs of summer and winter schools and programs of topical seminars, I decided to study for a longer term at KIAS. The support by Professor Exchange

## COMMENTS FROM KIAS VISITORS

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Program from Korea University Council and the partial support by KIAS visitors program enabled me to stay at KIAS for one year starting from September 1, 2004.

The primary purpose of my visit to KIAS is to learn computational techniques for protein folding. The secondary, but less important, purpose is to get a time free from the duty of lecture and to complete writing papers that I postponed during last few years. The primary purpose will be fulfilled by communicating and collaborating with young scientists (mostly postdocs) in the Protein Folding Group. After a month from the beginning of my visit, Professor Jooyoung Lee left for US for his first sabbatical, asking me to lead the weekly Journal Club (JC) meeting of Protein Folding Group. This became a nice chance for me to communicate with young scientists group for their research works. The JC meeting is going on, surveying the most update research papers, reviewing interesting topics published recently, and delivering talks on the research outputs. Indeed, I have plenty of chances to discuss with postdocs, asking terms and computer algorithms and listening to their research works. All members in the group are kind enough to me.

Now, already five months of my visit have passed. Instead of endeavoring research on a specific topic while staying at KIAS, I wish to learn more general numerical techniques for my future research after returning to my home institution. Although I did not feel that I performed much of what I planned to do, I have learned several computational techniques that might be necessary for the future research on protein folding: the conformational space annealing developed by Professor Jooyoung Lee and known as one of the most efficient algorithms so far for the conformational search, parameter optimization, and the usage of software tool “tinker” packages with possibly modification of codes, all of which were impossible if I studied alone. In the next half year, I will concentrate on learning molecular dynamics calculations to investigate folding and unfolding pathways of proteins.

In the past years, most professors visited western countries for their refreshment of research powers. However, it is now unnecessary for at least theorists to do so since KIAS can provide the same, or even better facilities. This will save government’s or university budget as well as time for adaptation on new environment and new circumstances. In this respect, I hope that many institutions similar to KIAS which may offer visitors program would be founded in many places, particularly in local cities like Daegu where my home institution is located.

KIAS also supports many excellent academic activities in diverse areas of theoretical physics and mathematics. A school of parallel computations, summer and winter schools and international symposium on protein folding organized by School of Computational Sciences and also APCTP-KIAS school and satellite meeting of statmech organized by Theoretical Condensed Matter Physics were particularly helpful for me. Through these programs, participants not only benefit by listening to recent development of research works but they have chances to communicate with many well-known foreign scholars. In my experience, I feel that I had more chances of meeting well-known scholars at KIAS than I had when I visited US during my first sabbatical leave.

As most national institutions faced in the past, government expresses will of support when new

## COMMENTS FROM KIAS VISITORS

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institution is built. However, it will soon be weakened and budget will remain unincreased. Government officers seems to misunderstand that the same budget every year maintains the institution despite costs increase. After several years with this situation, the budget of the ambitiously built institution might not be exceptional at all. I hope that KIAS does not fall in a similar situation and that government realizes such a mistake and increases budget to encourage young respective professors working until midnight at KIAS. My another hope might be that KIAS plays its role as a leading institution in theoretical physics and mathematics and maintains its phase in the future as well.

## SCHOOL OF MATHEMATICS

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### *School of Mathematics*

The great success of modern science is largely due to the development of mathematics and analysis of models arising from natural and social phenomena. Research in the School of Mathematics includes both pure and applied mathematics such as algebra, algebraic geometry, topology, geometry, complex geometry, differential equations, etc.

#### **Faculty**

Distinguished Professor Zelmanov, Efim I.	<i>Algebra, Group Theory</i>
Professor Hwang, Jun-Muk	<i>Complex Geometry</i>
Professor Keum, JongHae	<i>Algebraic Geometry</i>
Professor Kim, Bumsig	<i>Geometry</i>
Professor Myung, Hyo Chul	<i>Lie Theory</i>
Professor Oh, Yong-Geun	<i>Differential Geometry</i>

#### **Research Fellows**

KIAS Assistant Professor Seo, Soogil	<i>Number Theory</i>
KIAS Assistant Professor Schweizer, A.	<i>Number Theory</i>
Dr. Chae, Myeongju	<i>Nonlinear PDE</i>
Dr. Choe, Insong	<i>Complex Geometry</i>
Dr. Hong, Kuk-Jin	<i>Number Theory (Modular Forms)</i>
Dr. Jeon, Daeyeol	<i>Number Theory</i>
Dr. Jun, Byungheup	<i>Algebraic Geometry</i>
Dr. Kang, Soon Yi	<i>Special Functions, Combinatorics, and Number Theory</i>
Dr. Kim, Dong Han	<i>Ergodic Theory</i>
Dr. Kim, Jeong-Ah	<i>Lie Algebra and Representation Theory</i>
Dr. Kim, Sung Yeon	<i>Several Complex Variables</i>
Dr. Kolesnikov, Pavel	<i>Conformal Algebra</i>
Dr. Lee, Hyeonmi	<i>Lie Algebra and Representation Theory</i>
Dr. Lee, Joongul	<i>Number Theory</i>
Dr. Lee, Sangyop	<i>Low Dimensional Topology</i>
Dr. Lee, Seok-Min	<i>Number Theory</i>
Dr. Matsumi, Kazuya	<i>Galois Representation and Mori Theory</i>
Dr. Myung, Sung	<i>Algebraic K-theory and Motivic Cohomology</i>
Dr. Oh, Youngtak	<i>Lie Algebra and Representation Theory</i>
Dr. Park, Euisung	<i>Projective Algebraic Geometry</i>
Dr. Shin, Dong-Uy	<i>Lie Algebra and Representation Theory</i>
Dr. Song, Wontaek	<i>Geometric Topology and Topological Dynamics</i>
Dr. Sung, Chanyoung	<i>Differential Geometry</i>
Dr. Wang Sung Ho	<i>Geometric Partial Differential Equations</i>
Dr. Yoon, Joung-Hahn	<i>Geometry and Its Applications</i>

School of Mathematics hosted a special event in the year of 2004. The inaugural meeting of

## SCHOOL OF MATHEMATICS

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Korean Women in Mathematical Sciences (KWMS) took place on June 21-23 at KIAS. To celebrate the inauguration, KWMS concurrently organized an international workshop at KIAS. Organizers were S. Cho (Ajou U.), Y.-J. Choie (POSTECH), S.-Y. Jang (Ulsan U.), S.-Y. Kang (KIAS), W. Kim (Hoseo U.), H. Lee (Ewha U.), K. Koh Park (Ajou U.) and I. Wee (Korea U.). It featured several guest speakers including M. Choda (Osaka Kyoiku U.), J. Hawkins (U.N.C., Chair of Science Policy Committee for American Mathematical Society), L. Walling (U. Colorado), and six young Korean women mathematicians who are working abroad. All of them delivered excellent talks for diverse audience. The quality of both mathematics and presentations given by these female mathematicians from abroad promised a bright future of Korean mathematics. Besides invited talks, there were four parallel sessions and panel discussions on “Women’s Role in Mathematics”. Panelists emphasized that strengthening their roles as researchers as well as educators by women mathematicians is very important for the society. The society also received endorsements and congratulatory messages from various individuals and organizations such as Association for Women in Mathematics and European Women in Mathematics from abroad.

In addition, in 2004 School of Mathematics organized five international conferences.

In May there was “Conference on q-series and Special Functions”, organized by Y.-S. Choi (Korea University), S.-Y. Kang (KIAS) and J. Sohn (Yonsei University). Invited speakers at the conference included B. Berndt (U. Illinois Urbana-Champaign), H.-H. Chan (NU Singapore), Y.-J. Choie (POSTECH), M. Katsurada (Keio U), D. Kim (KAIST), J.-H. Kwon (U. Seoul), Z.-G. Lui (ECNU, Shanghai), A.-J. Yee (Penn. State U) and J. Yi (Pukyong National U). Presentations focused on the recent developments in analytic number theory and its interactions with other areas of mathematics such as combinatorics and representation theory.

In July J. Keum (KIAS) and S. Kondo (Nagoya U.) organized “Korea-Japan Conference on Algebraic Geometry” in honor of the 60th birthday of Professor I. Dolgachev (U. Michigan). Invited speakers included V. Alexeev (U. Georgia), B. van Geemen (U. Milano), M. Gizatullin (Samara S.A.U.), T. Katsura (U. Tokyo), E. Looijenga (U. Utrecht), V. Nikulin (U. Liverpool), K. Oguiso (U. Tokyo), M.-H. Saito (Kobe U.), I. Shimada (Hokkaido U.), T. Shioda (Rikkyo U.), A. Verra (U. Rome), and D.-Q. Zhang (N. U. Singapore). Topics discussed in the conference cover some of the most active areas of research in algebraic geometry today, in particular, those related to K3 surfaces and various moduli spaces.

“Workshop on Complex Geometry” organized by I. Choe, J.-M. Hwang, and B. Kim (KIAS) in October consisted of survey lecture series which were designed to present some of the recently developed ideas and techniques in complex geometry. Speakers and titles of the lecture series were N. Mok (U. Hong Kong) “Quotients of bounded symmetric domains of finite volume”, M. Paun (U. Strasbourg) “Positivity of line bundles in algebraic and analytic geometry”, G. Schumacher (U. Marburg) “Analytic theory of moduli spaces” and S. Takayama (U. Tokyo) “On varieties with large fundamental group”.

“Korea-Japan Joint Workshop in Mathematics 2004” held at KIAS in November was organized by J.-M. Hwang, B. Kim (KIAS) and M.-S. Saito (Kobe U.) which was the fourth joint annual

## SCHOOL OF MATHEMATICS

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workshop between KIAS and Japan. Speakers from the Korean side were Y. S. Cho (Ewha U.), J. Park (S.N.U.), J. Kim (KAIST), Y.-H. Kiem (S.N.U.), H. Kim (Kyungpook N.U.), K. Oh (U. Missouri), and S. Hwang (Chung-Ang U). Those from Japanese side were U. Frauenfelder (Hokkaido U.), M. Guest (Tokyo Metropolitan U.), S. Hosono (U. Tokyo), M. Inaba (Kyushu U.), M. Jinzenji (Hokkaido U.), H. Kanno (Nagoya U.), K. Ono (Hokkaido U.), K. Saito (RIMS), M.-H. Saito (Kobe U.), A. Takahashi (RIMS) and K. Yoshioka (Kobe U.). This year's theme was in the area of symplectic topology and mathematical physics. The meeting provided symplectic geometers and mathematical physicists from both countries with an excellent opportunity for lively discussions in a stimulating and friendly atmosphere.

In December, "KIAS-POSTECH-SNU International Number Theory Workshop: Modular Forms and Related Topics", was organized by Y.-J. Choie (POSTECH), M.-H. Kim (S.N.U.) and D. Jeon (KIAS). Invited speakers at the workshop were C. Choi (POSTECH), Y. Choi (Korea U.), D. Jeon (KIAS), M. Kaneko (Kyushu U.), W. Kohlen (Heidelberg U.), V. Maillot (Institut Jussieu), S. Myung (KIAS), B. Oh (Sejong U.), A. Panchishkin (Institut Fourier) and Y. Taguchi (Kyushu U.). The topics discussed in the workshop ranged from very classical subjects such as those involving explicit calculation with modular forms to modern approaches to number theory such as motivic cohomology.

In addition to international conferences, there were a number of lecture series. H. Hu (Michigan State U.) gave three lectures on ergodic theory concerning equilibrium states with singular potential functions. M. Waldschmidt (Institut Jussieu), President of Societe Mathematiques de France, visited KIAS and delivered special lectures on the state of the art in transcendental number theory. B. Siebert (U. Freiburg) gave five lectures on his approach to mirror symmetry via logarithmic degeneration. A. Cap (U. Vienna) presented four lectures on parabolic geometry introducing some new differential geometric methods with applications to complex analysis and geometric partial differential equations. C. Sabbah (Ecole Polytechnique) delivered four lectures on Frobenius-Saito structures which gave new approaches to the study of singularity as well as mirror symmetry.

In June, Professor Hyo Chul Myung at KIAS delivered a special lecture on "20th Century-Renaissance of Mathematics". It was also the 22nd Parliamentary Special Lecture.





Prof. Lynn Walling (University of Colorado) delivers a lecture on “Quadratic forms and automorphic forms” at the 1st International Workshop for Korean Women in Mathematics on June 23, 2004.



Prof. Kyoji Saito (Research Institute for Mathematical Sciences) delivers a lecture on “the Semi-Algebraic Geometry of the Braid Groups and Artin Groups” at the KIAS International Conference on KOREA-JAPAN Joint Workshop in Mathematics, November 1-5, 2004

## SCHOOL OF MATHEMATICS

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### Visiting Scientists

Moon, D. H.  
December 22, 2003 – February 13, 2004  
Affine Hecke Algebra  
Sejong University

Mimura, Mamoru  
February 1, 2004 – February 4, 2004  
Topology  
Okayama University

Kwon, J. H.  
December 29, 2003 – February 28, 2004  
Representation Theory  
University of Seoul

Lee, Jung-seob  
February 4, 2004 – February 6, 2004  
Ergodic Theory  
Ajou University

Kim, Hoil  
January 1, 2004 – June 30, 2004  
Algebraic Geometry  
Kyungpook National University

Oh, Kyungho  
February 9, 2004 – February 28, 2004  
Algebraic Geometry  
University of Missouri

Ryu, Jeong Seog  
January 3, 2004 – February 28, 2004  
Work on Bihamiltonian System  
Hongik University

Kim, Kang-Tae  
February 9, 2004 – February 12, 2004  
Several Complex Variables  
Pohang University of Science and  
Technology

Park, J. S.  
January 03, 2004 – February 28, 2004  
Integrable system  
Dongguk University

Park, E. S.  
February 10, 2004 – February 14, 2004  
On the Tetragonal Modular Curves  
Korea Advanced Institute of Science and  
Technology

Park, Jae-Suk  
January 2, 2004 – January 17, 2004  
Symmetry Geometry  
Pohang University of Science and  
Technology

Koh, Kyewon  
February 10, 2004 – February 28, 2004  
Ergodic System  
Ajou University

Vidal, Isabelle  
January 22, 2004 – January 29, 2004  
Arithmetic Geometry  
Nagoya University

Lee, S. H.  
February 11, 2004 – February 18, 2004  
Differential Operator on Lie group  
Youngdong University

Hu, Huyi  
January 31, 2004 – February 14, 2004  
Ergodic and Geometric Theories of  
Chaotic Dynamical Systems  
Michigan State University

Kawamata, Y  
February 18, 2004 – February 24, 2004  
Algebraic Geometry  
University of Tokyo

## SCHOOL OF MATHEMATICS

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Park, Jihun  
February 18, 2004 – February 26, 2004  
Algebraic Geometry  
Pohang University of Science and  
Technology

Lee, Yongnam  
February 18, 2004 – February 24, 2004  
Algebraic Geometry  
Sogang University

Oguiso, K.  
February 18, 2004 – February 24, 2004  
Algebraic Geometry  
University of Tokyo

Cheltsov, Ivan  
February 18, 2004 – February 25, 2004  
Algebraic Geometry  
University of Edinburgh

Nakaishi, Kentaro  
February 24, 2004 – February 28, 2004  
Ergodic Theory and Multidimensional  
Continued Fraction Algorithms  
University of Tokyo

Waldschmidt, Michel  
February 24, 2004 – March 5, 2004  
Number Theory  
Universite Pierre et Marie Curie (ParisVI)

Los, Jerome  
March 3, 2004 – March 20, 2004  
On Pseudo-Anosov Maps  
Clay Mathematics Institute, University of  
Provence

Oh, Kyungho  
March 5, 2004 – April 21, 2004  
Algebraic Geometry  
University of Missouri

Ito, Hiroyuki  
March 9, 2004 – March 17, 2004  
Elliptic Surfaces  
Hiroshima University

Moon, D. H.  
March 11, 2004 – June 26, 2004  
Affine Hecke Algebra  
Sejong University

Hamachi, Toshihiro  
March 14, 2004 – March 15, 2004  
Semigroup Presentations of Symbolic  
Dynamical Systems  
Kyushu University

Park, Jihun  
March 19, 2004 – March 21, 2004  
Algebraic Geometry  
Pohang University of Science and  
Technology

Park, Jihun  
March 25, 2004 – March 27, 2004  
Algebraic Geometry  
Pohang University of Science and  
Technology

Martinez, C.  
March 27, 2004 – April 4, 2004  
Super Jordan Algebras  
University of Oviedo

Cho, J. H.  
April 1, 2004 – August 31, 2004  
Topology

Lee, Yongnam  
April 8, 2004 – April 8, 2004  
Algebraic Geometry  
Sogang University

## SCHOOL OF MATHEMATICS

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Park, Jihun April 9, 2004 – April 11, 2004 Algebraic Geometry Pohang University of Science and Technology	Hyeon, Donghoon May 14, 2004 – June 9, 2004 Algebraic Geometry Rice University
Tankeev, S. April 19, 2004 – May 10, 2004 Algebraic Geometry/Number Theory Vladimir State University	Yee, Ae Ja May 17, 2004 – July 31, 2004 Combinatorics Pennsylvania State University
Lee, Yongnam April 22, 2004 – April 22, 2004 Algebraic Geometry Sogang University	Woo, Y. H. May 18, 2004 – May 22, 2004 Geometry Pohang University of Science and Technology
Park, Jae-Suk April 24, 2004 – May 24, 2004 Geometry Pohang University of Science and Technology	Kim, T. H. May 18, 2004 – June 16, 2004 Algebra Rice University
Hahn, S. G. April 25, 2004 – May 1, 2004 Number Theory Korea Advanced Institute of Science and Technology	Lee, Yoonjin May 20, 2004 – August 20, 2004 Algebraic Number Theory Smith College
Oh, Kyungho April 29, 2004 – June 5, 2004 Algebraic Geometry University of Missouri	Liaw, Wen-Chin May 21, 2004 – May 23, 2004 Q-Series National Chung Cheng University
Martinez, C. May 9, 2004 – May 22, 2004 Super Jordan Algebras University of Oviedo	Ruan, Wei-dong May 28, 2004 – June 17, 2004 Differential Geometry University of Illinois at Chicago
Berndt, Bruce C. May 13, 2004 – May 29, 2004 Number Theory University of Illinois	Sato, Fumitoshi June 6, 2004 – June 9, 2004 Geometry University of Utah

## SCHOOL OF MATHEMATICS

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Dolgachev, I.  
June 11, 2004 – July 10, 2004  
Algebraic Geometry  
University of Michigan

Lee, Yongnam  
July 1, 2004 – July 9, 2004  
Algebraic Geometry  
Sogang University

Yoon, Jin Woo  
July 1, 2004 – November 30, 2004  
Lie Algebra  
Korea Advanced Institute of Science and  
Technology

Heo, J. S.  
July 5, 2004 – July 17, 2004  
Operator Algebra and Noncommutative  
Differential Geometry  
Chungnam National University

Kwak, Si-Jong  
July 5, 2004 – July 9, 2004  
Algebraic Geometry  
Korea Advanced Institute of Science and  
Technology

Fathi, Albert  
July 11, 2004 – July 18, 2004  
Dynamical Systems  
Ecole Normale Supérieure de Lyon

Oh, Kyungho  
July 17, 2004 – July 24, 2004  
Algebraic Geometry/Theoretical Physics  
University of Missouri

Park, J. S.  
July 20, 2004 – August 31, 2004  
Geometry  
Korea Advanced Institute of Science and  
Technology

Schwarz, Albert  
July 21, 2004 – August 7, 2004  
Mathematical Physics (Geometry)  
University of California, Davis

Nishimori, Yasunori  
July 22, 2004 - July 25, 2004  
Algebra  
National Institute of Advanced Industrial  
Science and Technology

Kang, B. K.  
July 24, 2004 – July 31, 2004  
Commutative Algebra  
Pohang University of Science and Technology

Uchiyama, Atsushi  
July 25, 2004 – August 1, 2004  
Algebra  
Sendai National College of Technology

Choie, Y. J.  
July 28, 2004 – August 2, 2004  
Number Theory  
Pohang University of Science and  
Technology

Oh, Kyungho  
August 1, 2004 – December 31, 2004  
Algebraic Geometry/Theoretical Physics  
University of Missouri

Iohara, Kenji  
August 2, 2004 – December 31, 2004  
Representation Theory  
Kobe University

Chun, J. H.  
August 2, 2004 – August 7, 2004  
Programming to Determine the Gonality of  
Modular Curves  
Yanbian University of Science and  
Technology

## SCHOOL OF MATHEMATICS

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Akahori, Takao August 4, 2004 – August 8, 2004 Complex Geometry Himeji Institute of Technology	Li, Anly September 4, 2004 – September 8, 2004 Number Theory Fu Jen University
Ochiai, T. August 9, 2004 – August 13, 2004 Algebra Osaka University	Yao, Wei-Chen September 4, 2004 – September 8, 2004 Number Theory Taipei Municipal Teachers College
Siebert, Bernd August 11, 2004 – August 20, 2004 Geometry University of Freiburg	Yu, Jing September 4, 2004 – September 8, 2004 Number Theory National Center for Theoretical Sciences
Woo, Youngho August 13, 2004 – August 19, 2004 Algebraic Geometry Pohang University of Science and Technology	Koo, Hyeng Keun September 8, 2004 – December 30, 2004 Mathematical Finance Ajou University
Burns, D. August 23, 2004 – August 29, 2004 Complex Analysis/Differential Geometry University of Michigan	Woo, Y. H. October 18, 2004 – October 22, 2004 Geometry Pohang University of Science and Technology
Heo, J. S. August 23, 2004 – August 28, 2004 K-Theory & Scalar Curvature Chungnam National University	Hong, Jaehyun October 26, 2004 – November 8, 2004 Algebraic Geometry Seoul National University
Bokut, L. August 28, 2004 – September 26, 2004 Algebras and Combinatorics Russian Academy of Science	Bokut, L. October 27, 2004 – October 31, 2004 Combinatorial Algebra/Ring theory/ Group Theory Sobolev Institute of Mathematics
Maltsev, Y. August 28, 2004 – September 26, 2004 Algebras and Combinatorics Altai State University	Maillot, Vincent November 26, 2004 – December 10, 2004 Algebraic Geometry Institute de Mathematiques de Jussieu

## SCHOOL OF MATHEMATICS

---

Cap, Andreas

November 28, 2004 – December 10, 2004

Geometry

University of Vienna

Yoon, Jin Woo

December 1, 2004 – April 30, 2005

Collaborative Work

Korea Advanced Institute of Science and  
Technology

Chainikov, V.

December 4, 2004 – December 20, 2004

Research on Garside Structure for  
Singular Braids

Novosibirsk State University

Yamada, H.

December 5, 2004 – December 11, 2004

Singularities related with Lie theory

Kitami Institute of Technology

Sabbah, C.

December 6, 2004 – December 18, 2004

Algebraic Geometry

Ecole Polytechnique

To, W.K

December 10, 2004 – December 20, 2004

Complex Geometry

National University of Singapore

Kim, D. Y.

December 13, 2004 – December 27, 2004

Algebraic Number Theory

Korea Advanced Institute of Science and  
Technology

Byeon, Jaeyoung

December 19, 2004 – December 24, 2004

Differential Equation/Differential  
Geometry

Pohang University of Science and  
Technology

Lee, Yoonjin

December 20, 2004 – January 20, 2005

Algebraic Number Theory

Smith College

Moon, D. H.

December 22, 2003 – February 13, 2005

Affine Hecke Algebra

Sejong University

Kwon, J. H.

December 23, 2004 – December 29, 2004

Collaborative Work

University of Seoul



## SCHOOL OF MATHEMATICS

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### Research Activities (Workshops, Symposia, Conferences, Seminars, etc.)

#### Workshops/Symposia/Conferences

- Representation Theory Camp (February 5, 2004 ~ February 6, 2004)  
Conference on q-series and Special Functions (May 22, 2004 ~ May 22, 2004)  
Summer Course on Symplectic Geometry (June 10, 2004 ~ August 31, 2004)  
1st International Workshop for Korean Women in Mathematics (June 21, 2004 ~ June 23, 2004)  
Representation Theory Camp (June 21, 2004 ~ June 25, 2004)  
Special Lecture by Prof. Hyo Chul Myung: "20th Century-Renaissance of Mathematics"  
(June 23, 2004)  
Korea-Japan Conference on Algebraic Geometry in honor of Professor Igor Dolgachev on his  
60th birthday (July 5, 2004 ~ July 9, 2004)  
KIAS Workshop on Complex Geometry (October 19, 2004 ~ October 21, 2004)  
Korea-Japan Joint Workshop in Mathematics 2004 (November 1, 2004 ~ November 5, 2004)  
KIAS-POSTECH International Conference on Number Theory  
(December 1, 2004 ~ December 2, 2004)

#### Seminars

- |   |  |
|---|--|
| January 14, 2004<br>Park, Jaesuk (City University of New York)<br>Flat Family of Quantum Fields Theories &<br>Quantization of d-Algebras                                  | January 28, 2004<br>Moreau, Alban (Institut de Mathematiques<br>de Jussieu)<br>Segal's Conjecture and Arason Invariant of<br>Quadratic Forms |
| January 14, 2004<br>Oh, Yong-geun<br>(Korea Institute for Advanced Study/<br>University of Wisconsin at Madison)<br>Geometry of Hamiltonian Homeomorphisms                | January 28, 2004<br>Vidal, Isabelle (Nagoya University)<br>Wild Ramification of l-Adic Sheaves   |
| January 15, 2004<br>Seo, Byoung Ki (Korea Advanced Institute of<br>Science and Technology)<br>Asymptotic Behaviors of the First Return Time<br>of Translations on a Torus | February 4, 2004<br>Hu, Huyi (Michigan State University)<br>Equilibrium States of Some Non-Holder<br>Potentials                              |
| January 15, 2004<br>Park, Jaesuk (City University of New York)<br>Principle of Quantum Fields Theory & Quantum<br>Deformation Theory                                      | February 5, 2004<br>Hu, Huyi (Michigan State University)<br>Equilibrium States of Some Non-Holder<br>Potentials II                           |
|   | February 6, 2004<br>Hu, Huyi (Michigan State University)<br>Equilibrium States of Some Non-Holder<br>Potentials III                          |

## SCHOOL OF MATHEMATICS

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<p>February 23, 2004                      Oguiso, Keiji (University of Tokyo)                      Automorphism Groups of Generic Hyperkähler                      Manifolds</p>	<p>March 4, 2004                      Jeon, Daeyeol                      (Korea Institute for Advanced Study)                      Number Theory Seminar: Bielliptic Modular                      Curves X1(N)</p>
<p>February 23, 2004                      Cheltsov, Ivan (University of Georgia)                      On rationality of Enriques-Fano 3-Folds</p>	<p>March 10, 2004                      Choi, So-Young (Korea Advanced Institute of                      Science and Technology)                      Number Theory Seminar: An Affine Model of <math>X_0(p, q)</math></p>
<p>February 23, 2004                      Kawamata, Yujiro (University of Tokyo)                      Derived Equivalence of Algebraic Varieties</p>	<p>March 10, 2004                      Los, Jérôme (Universite de Provence)                      Minimal Periodic Orbit Structures for Graph Maps</p>
<p>February 24, 2004                      Cheltsov, Ivan (University of Georgia)                      Non-Rational Complete Intersections</p>	<p>March 11, 2004                      Ito, Hiroyuki (Hiroshima University)                      On the Mordell-Weil Groups of Elliptic                      Surfaces in Positive Characteristic</p>
<p>February 25, 2004                      Waldschmidt, Michel                      (Institut de Mathematiques de Jussieu)                      Transcendental Number Theory: the State of                      the Art (I)</p>	<p>March 15, 2004                      Hamachi, Toshihiro (Kyushu University)                      Semigroup Presentations of Symbolic                      Dynamical Systems</p>
<p>February 26, 2004                      Nakaishi, Kentaro (University of Tokyo)                      Convergence of Multidimensional Continued                      Fraction Algorithms</p>	<p>March 25, 2004                      Noma, A. (Yokohama National University)                      Multisecants to Projective Varieties</p>
<p>February 27, 2004                      Shim, Seong-A (Pusan National University)                      Properties of Competition Diffusion Systems</p>	<p>March 26, 2004                      Kim, Mijoung (Pohang University of Science                      and Technology)                      D-Dar Neumann Operator and the Kobayashi Metric</p>
<p>February 27, 2004                      Elstner, Marcus (University of Paderborn)                      QM/MM Simulations of Biomolecular Structures                      and Processes in their Electronic Ground and                      Excited States using an Approximate DFT Method</p>	<p>March 31, 2004                      Schweizer, Andreas                      (Korea Institute for Advanced Study)                      Number Theory Seminar: On the Torsion of                      Elliptic Curves over Cubic Number Fields</p>
<p>March 2, 2004                      Waldschmidt, Michel                      (Institut de Mathematiques de Jussieu)                      Transcendental Number Theory: the State of                      the Art (II)</p>	<p>April 9, 2004                      Chang, Gyu Whan (Incheon University)                      Strong Mori domains and the Ring <math>D[X]_{N, \nu}</math></p>

## SCHOOL OF MATHEMATICS

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April 21, 2004 Tankeev, Sergey (Vladimir State University) Algebraicity of the Hodge Star Operator for Complex Projective Varieties	May 17, 2004 Berndt, Bruce C. (University of Illinois at Urbana-Champaign) Ramanujan (II); Ramanujan's Contributions to Eisenstein Series especially in his Lost Notebook
April 22, 2004 Tankeev, Sergey (Vladimir State University) Weights of l-Adic Representations	May 20, 2004 Hyeon, Donghoon (Rice University) Moduli Space of Stable Pairs: Constructions
April 22, 2004 Jeong, Moon Ja (University of Suwon) Covering Structure of Bell Representations	May 21, 2004 Chan, Heng Huat (National University of Singapore) Representations of Integers as Sums of Even Squares, a Survey.
April 26, 2004 Tankeev, Sergey (Vladimir State University) Conjectures of M. Artin and Shafarevich-Tate	May 21, 2004 Liaw, Wen-Chin (National Chung Cheng University) Cranks and Dissections in Ramanujan's Lost Notebook
April 28, 2004 Tankeev, Sergey (Vladimir State University) Mumford-Tate Groups associated with Rational Hodge Structures	June 4, 2004 Kim, Taehee (Rice University) Filtrations of the Knot Concordance Group
April 30, 2004 Choe, Insong (Korea Institute for Advanced Study) Lines and Linear Spaces in Moduli of Vector Bundles	June 4, 2004 Ruan, Wei-Dong (Univeristy of Illinois at Chicago) Lagrangian Torus Fibrations for Calabi-Yau Manifolds I
May 6, 2004 Park, Jaesuk (City University of New York) Graded Noncommutaive Rings and QFTs	June 4, 2004 Ruan, Wei-Dong (Univeristy of Illinois at Chicago) Lagrangian Torus Fibrations for Calabi-Yau Manifolds II
May 15, 2004 Cho, Hong Rae (Pusan National University) Lipschitz-Type Spaces of Holomorphic Functions	June 7, 2004 Sato, Fumitoshi (University of Utah) Relations in Tautological Rings by Localization
May 17, 2004 Berndt, Bruce C. (University of Illinois at Urbana-Champaign) Ramanujan (I); Ramanujan's Lost Notebook	

## SCHOOL OF MATHEMATICS

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June 10, 2004 Oh, Yong-Geun (Korea Institute for Advanced Study/ University of Wisconsin at Madison) Introduction to Symplectic Topology	June 24, 2004 Oh, Yong-Geun (Korea Institute for Advanced Study/ University of Wisconsin at Madison) Introduction to Symplectic Topology
June 10, 2004 Jun, Byungheup (Korea Institute for Advanced Study) Period Determinant of Even Irregular Singular Connections on Elliptic Curves	July 6, 2004 Heo, Jaeseong (Chungnam National University) Properties of Groups with Property T of Kazhdan
June 11, 2004 Ruan, Wei-Dong (University of Illinois at Chicago) Generalized Special Lagrangian Torus Fibrations for Calabi-Yau	July 8, 2004 Heo, Jaeseong (Chungnam National University) Groups with Haagerup Approximation Property
June 14, 2004 Hyeon, Donghoon (Rice University) GIT of Bicanonically Embedded Curves	July 13, 2004 Fathi, Albert (Ecole Normale Supérieure de Lyon) Weak KAM Theory: Viscosity Solutions for PDE's and the Aubry-Mather theory in Lagrangian Dynamics, I
June 17, 2004 Oh, Yong-Geun (Korea Institute for Advanced Study/ University of Wisconsin at Madison) Introduction to Symplectic Topology	July 13, 2004 Heo, Jaeseong (Chungnam National University) $L^2$ -Betti Numbers for Groups and Equivalence Relations
June 17, 2004 Yee, Ae Ja (Pennsylvania State University) Overpartition (I)	July 15, 2004 Oh, Yong-Geun (Korea Institute for Advanced Study/ University of Wisconsin at Madison) Introduction to Symplectic Topology
June 17, 2004 Yee, Ae Ja (Pennsylvania State University) Overpartition (II)	
June 18, 2004 Koo, Hyung Keun (Ajou University) Asset Pricing with Birth and Death of Assets	July 15, 2004 Heo, Jaeseong (Chungnam National University) Application of $L^2$ -Betti Numbers to Von Neumann Algebras

## SCHOOL OF MATHEMATICS

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July 15, 2004

Fathi, Albert  
(Ecole Normale Superieure de Lyon)  
Weak KAM Theory: Viscosity Solutions for  
PDE's and the Aubry-Mather Theory in  
Lagrangian Dynamics, II

July 22, 2004

Lee, Junho  
(Korea Institute for Advanced Study)  
Family Gromov-Witten Invariants

July 23, 2004

Oh, Yong-Geun  
(Korea Institute for Advanced Study/  
University of Wisconsin at Madison)  
Introduction to Symplectic Topology

July 23, 2004

Park, Jihun (Pohang University of Science  
and Technology)  
Introduction to Motivic Integration

July 26, 2004

Lee, Sang Jin (Konkuk University)  
Semidirect Products of Garside Groups and  
Translation Numbers

July 27, 2004

Lee, Yoonjin (Smith College/Korea Institute  
for Advanced Study)  
Number Theory Seminar: Subgroups of Any  
Order in Class Groups of Global Function  
Fields

July 29, 2004

Oh, Yong-Geun  
(Korea Institute for Advanced Study/  
University of Wisconsin at Madison)  
Introduction to Symplectic Topology

July 29, 2004

Schweizer, Andreas  
(Korea Institute for Advanced Study)  
Non-Standard Automorphisms of  $SL_2$  over  
Arithmetic Dedekind Domains and Level of  
Subgroups

August 3, 2004

Ahn, Heung Ju (University of Padova)  
Non-Subelliptic Estimates for the Tangential  
Cauchy-Riemann System

August 3, 2004

Schwarz (University of California, Davis)  
On 2D Topological Quantum Field Theory

August 4, 2004

Hwang, Jun-Muk  
(Korea Institute for Advanced Study)  
A Bound on the Number of Curves of a Given  
Degree

August 5, 2004

Oh, Yong-Geun  
(Korea Institute for Advanced Study/  
University of Wisconsin at Madison)  
Introduction to Symplectic Topology

August 5, 2004

Akahori, Takao  
(Himeji Institute of Technology)  
On A-Branes with Real 5-Dimension

August 6, 2004

Park, Euisung (Korea Advanced Institute of  
Science and Technology)  
Higher Syzygies of Ruled Surfaces

August 6, 2004

Park, Euisung (Korea Advanced Institute of  
Science and Technology)  
The Minimal Free Resolution

## SCHOOL OF MATHEMATICS

---

August 9, 2004 Akahori, Takao (Himeji Institute of Technology) On A-Branes with Real 5-Dimension	August 13, 2004 Park, Euisung (Korea Advanced Institute of Science and Technology) Some Effects of Property $N_p$ on Noncomplete Linear Series II
August 9, 2004 Bolt, Michael D. (University of Michigan) Extremal Properties of Logarithmic Spirals	August 13, 2004 Siebert, Bernd (University Freiburg) Mirror Symmetry via Logarithmic Degeneration Data: Lecture I
August 10, 2004 Park, Euisung (Korea Advanced Institute of Science and Technology) The Minimal Free Resolution of Homogeneous Coordinate Rings	August 13, 2004 Siebert, Bernd (University Freiburg) Mirror Symmetry via Logarithmic Degeneration Data: Lecture II
August 10, 2004 Park, Euisung (Korea Advanced Institute of Science and Technology) Higher Syzygies of Ruled Surfaces	August 17, 2004 Siebert, Bernd (Univeristy Freiburg) Mirror Symmetry via Logarithmic Degeneration Data: Lecture III
August 11, 2004 Matsumi, P. (Korea Institute for Advanced Study) Level Lowering in Galois Representations associated to Cusp Forms (Survey)	August 18, 2004 Siebert, Bernd (University Freiburg) Mirror Symmetry via Logarithmic Degeneration Data: Lecture IV
August 11, 2004 Ochiai, Tadashi (Graduate School of Sciences, Osaka University) Toward a Generalization of the Iwasawa Theory.	August 18, 2004 Siebert, Bernd (University Freiburg) Mirror Symmetry via Logarithmic Degeneration Data: Lecture V
August 12, 2004 Oh, Yong-Geun (Korea Institute for Advanced Study/ University of Wisconsin at Madison) Introduction to Symplectic Topology	August 18, 2004 Kim, Hyun Kwang (Pohang University of Science and Technology) Codes over Poset Metrics
August 13, 2004 Park, Euisung (Korea Advanced Institute of Science and Technology) Some Effects of Property $N_p$ on Noncomplete Linear Series I	August 19, 2004 Oh, Yong-Geun (Korea Institute for Advanced Study/ University of Wisconsin at Madison) Introduction to Symplectic Topology

## SCHOOL OF MATHEMATICS

---

August 23, 2004 Lim, Sung-Geun (Yonsei University) Square Classes of Totally Positive Units	September 6, 2004 Yao, Wei-Chen (Taipei Municipal Teachers College) On Primitive Roots for Rank One Drinfeld Modules
August 25, 2004 Ko, Yangsuk (Cal State University Bakersfield) Convergence Analysis of a Space-Time Discontinuous Galerkin Method for Scalar Conservation Laws	September 6, 2004 Li, Anly (Fu-Jen University) On the Support Problem for Drinfeld Modules
August 25, 2004 Burns, D. (University of Michigan) Symplectic Geometry for Kaehler Manifolds	September 7, 2004 Representation Theory Group (Korea Institute for Advanced Study) Representation Theory Group Meeting
August 26, 2004 Park, Jinhyun (University of Chicago) Additive Higher Chow Groups I	September 9, 2004 Watanabe, Fumihiko On the $\Gamma(2)$ -Difference Equation Satisfied by the Hypergeometric Function of Matrix Form
August 26, 2004 Oh, Yong-Geun (Korea Institute for Advanced Study/ University of Wisconsin at Madison) Introduction to Symplectic Topology	September 10, 2004 Kolesnikov, Pavel (Korea Institute for Advanced Study) On Infinite Associative Conformal Algebras
August 27, 2004 Park, Jinhyun (University of Chicago) Additive Higher Chow groups II	September 14, 2004 Representation Theory Group (Korea Institute for Advanced Study) Representation Theory Group Meeting
August 27, 2004 Heo, Jaeseong (Chungnam National University) K-Theory and Baum-Connes Conjecture	September 16, 2004 Hwang, Jun-Muk (Korea Institute for Advanced Study) Working Seminar on Hodge Theory
August 30, 2004 Matsumi, P. (Korea Institute for Advanced Study) History of P-Adic Hodge Theory (from Tate to Hyodo-Kato-Kurihara-Tsuji)	September 21, 2004 Representation Theory Group (Korea Institute for Advanced Study) Representation Theory Group Meeting
September 6, 2004 Yu, Jing (National Tsing Hua University/ National Center for Theoretical Sciences) On Drinfeld's Exponentials and Logarithms	September 21, 2004 Sung, Chanyoung (Korea Institute for Advanced Study) Surgery and Yamabe Invariant

## SCHOOL OF MATHEMATICS

---

September 23, 2004 Hwang, Jun-Muk (Korea Institute for Advanced Study) Working Seminar on Hodge Theory	October 18, 2004 Cho, Cheolhyun (Northwestern University) A-Infinity Algebra for Quantum Cohomology and Open Closed Map as an A-Infinity Homomorphism
September 30, 2004 Hwang, Jun-Muk (Korea Institute for Advanced Study) Working Seminar on Hodge Theory	October 22, 2004 Myung, Sung (Korea Institute for Advanced Study) Introduction to Algebraic K-Theory, Part II
October 5, 2004 Hong, Jaehyun (Seoul National University) Rigidity of Schubert Varieties	October 26, 2004 Kim, Jeong-Ah (Korea Institute for Advanced Study) Representation Theory Group Meeting
October 5, 2004 Kolesnikov, Pavel (Korea Institute for Advanced Study) Informal Seminar on Representation Theory	October 27, 2004 Cho, Sanghyun (Sogang University) On the Extension of CR Structures and CR Forms
October 6, 2004 Schweizer, Andreas (Korea Institute for Advanced Study) Shared Values of Meromorphic Functions on Compact Riemann Surfaces	October 27, 2004 Kim, Sung Yeon (Korea Institute for Advanced Study) Local Embeddability of CR Manifolds into Spheres
October 8, 2004 Myung, Sung (Korea Institute for Advanced Study) Introduction to Algebraic K-Theory, Part I	October 29, 2004 Kolesnikov, Pavel (Korea Institute for Advanced Study) Differential Operator Algebras with Locality Condition
October 12, 2004 Hwang, Jun-Muk (Korea Institute for Advanced Study) Preliminary Discussion for Complex Geometry Workshop	October 29, 2004 Bokut, Leonid A. (Sobolev Institute of Mathematics) Free Lie Algebras and Grobner-Shirshov Bases of Some Group Constructions
October 12, 2004 Shin, Dong-Uy (Korea Institute for Advanced Study) Representation Theory Group Meeting	October 29, 2004 Choe, Insong (Korea Institute for Advanced Study) Working Seminar: Vector Bundles on Projective Spaces



## SCHOOL OF MATHEMATICS

---

- October 29, 2004  
Myung, Sung  
(Korea Institute for Advanced Study)  
Introduction to Algebraic K-Theory, Part III
- November 2, 2004  
Shin, Dong-Uy  
(Korea Institute for Advanced Study)  
Representation Theory Group Meeting
- November 5, 2004  
Myung, Sung  
(Korea Institute for Advanced Study)  
Introduction to Algebraic K-Theory, Part IV
- November 9, 2004  
Han, Chong-Kyu (Seoul National University)  
Complete Prolongation of Overdetermined PDE  
Systems and Finiteness of Multi-Contact Maps
- November 9, 2004  
Wang, Sung Ho  
(Korea Institute for Advanced Study)  
CR Flat Submanifolds of Null Hyperquadrics
- November 9, 2004  
Oh, Young -Tak  
(Korea Institute for Advanced Study)  
Representation Theory Group Meeting
- November 9, 2004  
Lee, Jihoon (Sungkyunkwan University)  
Estimates for the Directional Wavelets
- November 10, 2004  
Park, Euisung  
(Korea Institute for Advanced Study)  
Working Seminar 'Vector Bundles on  
Projective Spaces' II
- November 10, 2004  
Frauenfelder (Hokkaido University)  
Symplectic Vortex Equations
- November 11, 2004  
Hwang, Jun-Muk  
(Korea Institute for Advanced Study)  
Working Seminar on Hodge Theory
- November 11, 2004  
Kim, Se-Goo (Kyung Hee University)  
Slice Knots and Quadratic Forms
- November 18, 2004  
Hwang, Jun-Muk  
(Korea Institute for Advanced Study)  
Working Seminar on Hodge Theory
- November 19, 2004  
Lee, Joongul  
(Korea Institute for Advanced Study)  
Working Seminar on Algebraic K-Theory
- November 23, 2004  
Lee, Hyeonmi  
(Korea Institute for Advanced Study)  
Representation Theory Group Meeting
- November 25, 2004  
Hwang, Jun-Muk  
(Korea Institute for Advanced Study)  
Working Seminar on Hodge Theory
- November 26, 2004  
Kim, Myungil (Seoul National University)  
K-Theory Working Seminar II
- November 29, 2004  
Cap, Andreas (University of Vienna)  
Introduction to Parabolic Geometry I
- November 30, 2004  
Choe, Insong  
(Korea Institute for Advanced Study)  
Working Seminar: Vector Bundles on  
Projective Spaces III
-

## SCHOOL OF MATHEMATICS

---

December 1, 2004 Cap, Andreas (University of Vienna) Introduction to Parabolic Geometry 2	December 9, 2004 Sabbah, Claude (Ecole Polytechnique) Frobenius-Saito Structures Attached to Laurent Polynomials 2
December 2, 2004 Cap, Andreas (University of Vienna) Introduction to Parabolic Geometry 3	December 13, 2004 Kang, Soon Yi (Korea Institute for Advanced Study) Q-Series Working Seminar II
December 6, 2004 Kang, Soon Yi (Korea Institute for Advanced Study) Q-Series Working Seminar I	December 14, 2004 Kolesnikov, Pavel (Korea Institute for Advanced Study) Representation Theory Group Meeting
December 6, 2004 Cap, Andreas (University of Vienna) Introduction to Parabolic Geometry 4	December 14, 2004 Sabbah, Claude (Ecole Polytechnique) Frobenius-Saito Structures attached to Laurent Polynomials 3
December 7, 2004 Kwon, Jae Hoon (University of Seoul) Representation Theory Group Meeting	December 15, 2004 Chainikov, Vladimir (Novosibirsk State University) The Semigroup of Singular Braids and Birman-Ko-Lee Generator
December 7, 2004 Sabbah, Claude (Ecole Polytechnique) Frobenius-Saito Structures Attached to Laurent Polynomials 1	December 15, 2004 To, Wing-Keung (National University of Singapore) $L^2$ -Metrics, Projective Flatness and Families of Polarized Abelian Varieties
December 8, 2004 Yamada (Kitami Institute of Technology) Symplectic Geometric Construction of Simple Singularities and Period Mapping	December 16, 2004 Sabbah, Claude (Ecole Polytechnique) Frobenius-Saito Structures attached to Laurent Polynomials 4
December 8, 2004 Maillot, Vincent (Institut de Mathematique de Jussieu) Complex Hermitian Geometric Techniques of Arakelov Geometry I	December 20, 2004 Kang, Soon Yi (Korea Institute for Advanced Study) Q-Series Working Seminar III
December 9, 2004 Maillot, Vincent (Institut de Mathematique de Jussieu) Complex Hermitian Geometric Techniques of Arakelov Geometry 2	

## SCHOOL OF MATHEMATICS

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December 21, 2004 Oh, Young-Tak (Korea Institute for Advanced Study) Representation Theory Group Meeting	December 24, 2004 Matsumi, P. (Korea Institute for Advanced Study) Class Field Theory from Takagi to Kato-Saito
December 22, 2004 Kang, Seok-Jin (Seoul National University) Intensive Lectures on Lie Algebras and Quantum Groups	December 24, 2004 Sato, Kanetomo (Nagoya University) Arithmetic on Arithmetic Schemes and Galois Cohomology.
December 22, 2004 Hwang, Jun-Muk (Korea Institute for Advanced Study) Working Seminar on Hodge Theory	December 27, 2004 Kang, Seok-Jin (Seoul National University) Intensive Lectures on Lie Algebras and Quantum Groups
December 23, 2004 Kajihara, Yasushi (Osaka University) Hypergeometric Transformations-An Approach from the Cauchy Kernel	December 28, 2004 Lee, Yoonjin (Smith College) Reflection Theorems of Quadratic Function Fields for Divisor Class Groups and Ideal Class Groups
December 23, 2004 Hwang, Jun-Muk (Korea Institute for Advanced Study) Working Seminar on Hodge Theory	December 30, 2004 Kang, Seok-Jin (Seoul National University) Intensive Lectures on Lie Algebras and Quantum Groups
December 23, 2004 Byeon, Jaeyoung (Pohang University of Science and Technology) Spike Layer Solutions for Singularly Perturbed Nonlinear Elliptic Problems	

## SCHOOL OF PHYSICS

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### Publications

Bak JG, Lee S

Restriction of the Fourier transform to a quadratic surface in  $\mathbb{R}^n$   
MATHEMATISCHE ZEITSCHRIFT 247 (2): 409-422 APR 2004

Bak JG, Lee S

Estimates for an oscillatory integral operator related to restriction to space curves  
PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY 132 (5): 1393-1401 2004

Chae M, Chrusciel PT

On the dynamics of Gowdy space-times  
COMMUNICATIONS ON PURE AND APPLIED MATHEMATICS 57 (8): 1015-1074 AUG 2004

Choe I, Hong JH

Integral varieties of the canonical cone structure on  $G/P$   
MATHEMATISCHE ANNALEN 329 (4): 629-652 AUG 2004

Elduque A, Myung HC

Composition algebras satisfying the flexible law  
COMMUNICATIONS IN ALGEBRA 32 (5): 1997-2013 2004

Fontana M, Park MH

Star operations and pullbacks  
JOURNAL OF ALGEBRA 274 (1): 387-421 APR 1 2004

Hong J, Kang SJ, Lee H

Young wall realization of crystal graphs for  $U_q(\mathbb{C}_n((1)))$   
COMMUNICATIONS IN MATHEMATICAL PHYSICS 244 (1): 111-131 JAN 2004

Hwang JM

On the volumes of complex hyperbolic manifolds with cusps  
INTERNATIONAL JOURNAL OF MATHEMATICS 15 (6): 567-572 AUG 2004

Hwang JM, Mok N

Automorphism groups of spaces of minimal rational curves on Fano manifolds of Picard number 1  
JOURNAL OF ALGEBRAIC GEOMETRY 13 (4): 663-673 OCT 2004

## SCHOOL OF PHYSICS

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Hwang JM, Ramanan S

Hecke curves and hitchin discriminant

ANNALES SCIENTIFIQUES DE L ECOLE NORMALE SUPERIEURE 37 (5): 801-817 SEP-OCT 2004

Jeon D, Kim CH

Bielliptic modular curves  $X-1(N)$

ACTA ARITHMETICA 112 (1): 75-86 2004

Jeon D, Kim CH, Schweizer A

On the torsion of elliptic curves over cubic number fields

ACTA ARITHMETICA 113 (3): 291-301 2004

Kang SJ, Kim JA, Lee H, Shin DU

Young wall realization of crystal bases for classical Lie algebras

TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY 356 (6): 2349-2378 2004

Kang SJ, Kwon JH

Crystal bases of the Fock space representations and string functions

JOURNAL OF ALGEBRA 280 (1): 313-349 OCT 1 2004

Kang SJ, Lee IS, Lee KH, Oh HY

Representations of Ariki-Koike algebras and Grobner-Shirshov bases

PROCEEDINGS OF THE LONDON MATHEMATICAL SOCIETY 89: 54-70 Part 1 JUL 2004

Kim C, Kim DH

On the law of logarithm of the recurrence time

DISCRETE AND CONTINUOUS DYNAMICAL SYSTEMS 10 (3): 581-587 APR 2004

Kim JA, Shin DU

Insertion scheme for the classical Lie algebras

COMMUNICATIONS IN ALGEBRA 32 (8): 3139-3167 2004

Kim M, Hain RM A

De Rham-Witt approach to crystalline rational homotopy theory

COMPOSITIO MATHEMATICA 140 (5): 1245-1276 SEP 2004

Kim N

Eigenvalues associated with the vortex patch in 2-D Euler equations

MATHEMATISCHE ANNALEN 330 (4): 747-758 DEC 2004

## SCHOOL OF PHYSICS

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Lee J

On the refined class number formula for global function fields

MATHEMATICAL RESEARCH LETTERS 11 (5-6): 583-587 SEP-NOV 2004

Noguchi J, Winkelmann J

Bounds for curves in abelian varieties

JOURNAL FUR DIE REINE UND ANGEWANDTE MATHEMATIK 572: 27-47 JUL

2004

Park MH

Group rings and semigroup rings over strong Mori domains, II

JOURNAL OF ALGEBRA 275 (2): 771-780 MAY 15 2004

Schweizer A

Torsion of Drinfeld modules and gonality

FORUM MATHEMATICUM 16 (6): 925-941 2004

Schweizer A

On periodic points under the iteration of additive polynomials

MANUSCRIPTA MATHEMATICA 113 (1): 25-34 JAN 2004

Seo S

On circular units over the cyclotomic  $\mathbb{Z}(p)$ -extension of an abelian field

MANUSCRIPTA MATHEMATICA 115 (1): 117-123 SEP 2004

Seo S

Euler systems and special units

JOURNAL OF NUMBER THEORY 109 (1): 59-68 NOV 2004

Seo S

A note on circular distributions

ACTA ARITHMETICA 114 (4): 313-322 2004

Sung CY

Surgery, curvature, and minimal volume

ANNALS OF GLOBAL ANALYSIS AND GEOMETRY 26 (3): 209-229 OCT 2004

Winkelmann J

Realizing connected Lie groups as automorphism groups of complex manifolds

COMMENTARII MATHEMATICI HELVETICI 79 (2): 285-299 APR 2004

## SCHOOL OF PHYSICS

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### *School of Physics*

The 20th century witnessed giant improvements in human condition, much of which were prompted and guided by accomplishments in natural sciences in general and physics in particular. It is hard to imagine our technology-driven world without the underlying modern physics, from a sweeping change of paradigm introduced by quantum mechanics to the invention of a little device known as the semiconductor. KIAS aspires to serve as a basin of fundamental knowledge that will play an important role in the 21st century. With such an aim, the school of physics conducts research in theoretical physics, and currently houses several active groups in string and field theory, particle physics, condensed matter physics, astrophysics, and astro-hadron physics.

### **Faculty**

Distinguished Professor Susskind, Leonard	<i>Theoretical Physics</i>
Emeritus Professor Kim, Chung Wook	<i>Neutrino Physics and Cosmology</i>
Professor Choi, Moo Young (Affiliate)	<i>Statistical and Condensed Matter Physics</i>
Professor Chun, Eung Jin	<i>Particle Physics</i>
Professor Kim, Yong Baek	<i>Condensed Matter Physics</i>
Professor Lee, Kimyeong	<i>Theoretical Physics</i>
Professor Park, Changbom	<i>Astrophysics and Cosmology</i>
Professor Park, Hyunggyu	<i>Statistical Physics</i>
Professor Yi, Piljin	<i>String Theory and Field Theory</i>

### **Research Fellows**

KIAS Assistant Professor Francesca, Borzumati	<i>Particle Physics Phenomenology</i>
KIAS Assistant Professor Lee, Jounghun	<i>Theoretical Cosmology</i>
KIAS Assistant Professor Park, Tae-Sun	<i>Effective Field Theories</i>
Dr. Choi, Yun-Young	<i>Astrophysics</i>
Dr. Ha, Meesoon	<i>Nonequilibrium Statistical Physics.</i>
Dr. Kang, Gungwon	<i>Gravity and Theoretical Physics</i>
Dr. Kim, Ki-Seok	<i>Condensed Matter Physics</i>
Dr. Kim, Mun Dae	<i>Condensed Matter Physics</i>
Dr. Kim, Seok	<i>Supersymmetry</i>
Dr. Kyaee, Bumseok	<i>Particle Physics</i>
Dr. Okamura, Naotoshi	<i>Phenomenology</i>
Dr. Park, Chan-Gyung	<i>Astrophysics</i>
Dr. Park, Jae-hyeon	<i>Particle Physics</i>
Dr. Park, Jae-Suk	<i>Foundation of Fields Quantum &amp; Strings Theories</i>
Dr. Kim, Juhan	<i>Large Scale Structure</i>
Dr. Park, Seong Chan	<i>High Energy Physics/Phenomenology</i>
Dr. Park, Su-Chan	<i>Nonequilibrium Systems</i>
Dr. Raeymaekers, Joris	<i>String Theory</i>

## SCHOOL OF PHYSICS

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Dr. Suyama, Takao

Dr. Yee, Ho-Ung

Dr. Yi, Sang-Heon

Dr. Scopel, Stefano

*String Theory*

*Field Theory & beyond the Standard Model Physics*

*Field Theory and String Theory*

*Particle Candidates for Dark Matter*

### **Quantum Field Theory & String Theory**

In year 2004, String and Field Theory Group of KIAS consisted of two professors, Kimyeong Lee and Piljin Yi, and seven research fellows, Dr. Gungwon Kang, Dr. Takao Suyama, Dr. Joris Raeymaekers, Dr. Ho-Ung Yee, Dr. Seok Kim, Dr. Sang-Heon Yi, and Dr. Jaesuk Park, with the latter three arriving in fall. The group hosted several schools and workshops for diverse group of participants. For many years KIAS with Seoul National University has been running two week Physics Winter Camp programs for bright junior and senior college students. With lectures on some deep subjects and seminars on current exciting development in physics, we hope younger generations to share broad and deep progress in our field subjects and to become creative scientists and leaders in society. In addition, there were two more schools with emphasis on graduate level topics. With Asian Pacific Center for Theoretical Physics, KIAS has held two week schools for the string theory in February, where several lecturers from India and Korea have provided solid lectures on supersymmetric gauge theory, supergravity, black holes and perturbative string theory. The other school was held at Pohang in August, again with APCTP, where beginning graduate students gathered to hear introductory lectures on cosmology, quantum field theory and standard model. Both programs help our graduate students and postdocs to build firmer background knowledge on these subjects, facilitating their research. In addition the group hosted two workshops for more advanced participants. With the phenomenology group, we had a one-day workshop ‘Trends in Physics’ to honor Prof. C.W. Kim’s retirement, who has been also the president of KIAS. With Hanyang University we also held a week long workshop on skyrmions and effective field theory. String and Field Theory group has been very active in research as well. One of the key topics was tachyon physics of unstable D-branes and unstable orbifolds in string theory, which was led by Prof. Piljin Yi, Dr. Ho-Ung Yee, and Dr. Joris Raeymaekers participated in this research effort. Dr. Ho-Ung Yee was also very productive on diverse subjects from supersymmetric theories, AdS/CFT duality, to supergravity models. Prof. Kimyeong Lee led research on supersymmetric theories and integrable models on non-commutative space, with Dr. Seok Kim and Dr. Ho-Ung Yee contributing to the effort as well. Dr. Gungwon Kang continued to work on the unstable black branes, on which he became an authority over the years. There have been many visitors including Prof. Erick Weinberg of Columbia University and Prof. Shigeki Sugimoto of Yukawa Institute, and they contributed much to our research atmosphere.

### **Statistical Physics & Condensed Matter Theory**

Statistical physics & condensed matter theory group started the year 2004 with three professors: Prof. Hyunggyu Park, Prof. Yong Baek Kim, Prof. Moo Young Choi (Affiliate), and five research fellows: Dr. Hangmo Yi, Dr. Hyunsuk Hong, Dr. Heung-Sun Sim, Dr. Su-Chan Park, and Dr. Meesoon Ha. The first three research fellows left KIAS to take a professorship, respectively at Soongsil University, Chonbuk National University, and KAIST, and two new fellows, Dr. Ki-Seok



## SCHOOL OF PHYSICS

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Kim and Dr. Mun Dae Kim came in. In addition, Dr. Sreedhar Dutta worked as a visiting research fellow for three months, and will join the group as a regular research fellow from coming March. Three academic meetings were hosted by the group: the 10th and the 11th “KIAS-APCTP Lectures on Nano-Mesoscopic Systems” were jointly organized by the APCTP in May 28-29 at KIAS and in December 17-18 at POSTECH. The May meeting focused on molecular devices and the December meeting on the noise in mesoscopic systems. In late June (June 29 - July 2), the international conference on “Nonequilibrium Statistical Physics of Complex systems” was hosted by the group, which is one of satellite meetings of STATPHYS22 held in India. More than 20 world-renowned speakers were invited, including Prof. K. Kawasaki (Boltzmann medalist) from Japan, Profs. J. M. Kosterlitz, R. K. P. Zia, M. den Nijs from U.S.A., and Prof. Mukamel from Weizmann. Drs. Hyunsuk Hong and Su-Chan Park also gave talks at the conference and Dr. Meesoon Ha presented a poster, which attracted much interest from foreign experts. Each member of the group made a solid progress in his/her research and produced noticeable results that have been published in or submitted to distinguished academic journals. To mention only a few, Prof. Hyunggyu Park introduced a model called “Driven Pair Contact Process with Diffusion” together with Dr. Su-Chan Park, which cleared out a recent hot controversy in reaction-diffusion absorbing critical phenomena. This work appeared in Physical Review Letters. Prof. M. Y. Choi investigated scale-free dynamics emerging from information transfer with Prof. Hyunggyu Park, which has been published in Europhysics Letters. Dr. Hyunsuk Hong studied collective behavior of coupled oscillators, which appeared in Physical Review E as a Rapid Communication. Dr. Ki-Seok Kim produced eight preprints in 2004 in the field of strongly correlated electron systems.

### **Astrophysics**

Astrophysics group consists of Prof. Changbom Park, and four research fellows. Prof. Park has organized the Korean Scientist Group of 13 Korean cosmologists and coordinated KIAS to join the international consortium of Sloan Digital Sky Survey (SDSS) as a representative institute in July, 2004. Using the most recent SDSS galaxy data, Prof. Park, Dr. Yun-Young Choi, Dr. Juhan Kim has measured the topological property of large scale structure, and found luminosity bias of topology for the first time. A part of the results was reported at the 1st KIAS International Workshop on Cosmology and Structure Formation held in Oct. 2004. Prof. Park and Dr. Kim have made two cosmological N-body simulations of the Cold Dark Matter model of the universe with the cosmological constant. They rate largest in the physical size and particle number among cosmological simulations made up to date. These simulations are used to study gravitational evolution of topology of large scale structure with unprecedented high accuracy. Also studied is the dependence of topology on kind of tracers of large scale structure like the Cold Dark Matter (CDM), biased density peaks, dark halos, and galaxies. Prof. Park and Dr. Chan-Gyung Park have measured the galaxy density and cosmic momentum power spectra from the peculiar velocities in the SFI spiral galaxy sample, and estimated certain matter density quantity which is consistent with recent studies. Dr. Jounghun Lee has studied the sub-halos of dark matter halos and the origin of large scale alignment of galaxies.

## SCHOOL OF PHYSICS

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### Particle Physics Phenomenology

There was a big change in the members of the particle physics group in 2004. Three research fellows, Dr. A. Akeroyd, A. Cornell and S. Baek, moved to KEK, Yukawa Institute in Japan and Montreal University in Canada, respectively. Three newcomers are Dr. S. Scopel from Torino University in Italy, Dr. B. Kyae from Bartol Institute in USA, and also Dr. J. H. Park arrived as a fresh Ph.D from KAIST. Dr. Scopel is a well-known expert in the field of supersymmetric dark matter, and Dr. Kyae is an active researcher in the field of extra dimensions. There have been four academic meetings hosted by the group in 2004. The first one was the KIAS Winter School (Feb. 23-27) in which three top-class researchers were invited to give extensive lectures on the inflationary Universe, density perturbation and the observation of anisotropy in cosmic microwave radiation. In the 3rd KIAS-KAIST Joint Workshop (June 7-11) domestic and foreign speakers got together to discuss current issues in particle physics. During October 4-9, KIAS and CHEP co-hosted the International Conference on Flavor Physics and CP Violation (FPCP2004) at EXCO, Daegu which was the third meeting after the first two meetings in Philadelphia and Paris. A one-day symposium, on the occasion of Prof. C.W. Kim's retirement, was held on October 25 to review the present status and the future perspectives in various areas in physics by inviting distinguished speakers in domestic institutions. Dr. A. Cornell continued his research program on B decay phenomenology together with his collaborators in India, and Dr. S. Baek looked for the feasibility of discovering supersymmetry in connection with the observation of B decay to muon and anti-muon and neutralino dark matter. Dr. S. C. Park kept his interest in the consequences of new physics models like little Higgs or split supersymmetry model in which the properties of black hole or neutrino were investigated. Dr. N. Okamura tried to find the solar neutrino mass effect in the future neutrino experiments with long baselines. Dr. F. Borzumati, a world-wide expert in supersymmetry and B physics, found a significant threshold correction to the mass of B and its coupling to Higgs bosons in CP violating SUSY models. This effect could be measured in future experiments. Prof. E. J. Chun worked on some cosmological implications of particle physics and has suggested an idea connecting the strong CP problem of particle physics to the density perturbations of the Universe.



Prof. Changbeom Park delivers a lecture on "Topology of Large Scale Structure" at the 1st KIAS International Workshop on Cosmology and Structure Formation, October 28–29, 2004



A Lecture by Prof. Kawasaki Kyoji (Fukuoka, Japan) is presented on “Two Characteristic Scales of Glass Forming Systems” at the Nonequilibrium Statistical Physics of Complex Systems: Satellite Meeting of STATPHYS 22 on June 30, 2004

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### Visiting Scientists

Rim, C. H.  
January 2, 2003 – February 29, 2004  
Integrable Model  
Chonbuk National University

Kim, Yup  
September 1, 2003 – February 28, 2004  
Statistical Mechanics  
Kyung Hee University

Kim, Nakwoo  
December 16, 2003 – January 15, 2004  
String Theory  
Kyung Hee University

Kim, Hyung Joon  
December 19, 2003 – January 12, 2004  
Chemical Physics in Biological Systems  
Carnegie Mellon University

Chang, Heonyoung  
December 19, 2003 – February 29, 2004  
Astrophysics  
Yonsei University

Lee, C. Y.  
December 20, 2003 – January 17, 2004  
Quantum Theta Function  
Sejong University

Shim, Youngseon  
December 22, 2003 – January 12, 2004  
Investigation of Dynamics of Ionic Liquids by  
MD Method  
Seoul National University

Kim, J. M.  
January 2, 2004 – February 28, 2004  
Statistical Physics  
Soongsil University

Jeong, Hyeong-Chai  
January 2, 2004 – June 30, 2004  
Condensed Matter Physics  
Sejong University

Sin, S. J.  
January 5, 2004 – February 25, 2004  
Particle Physics  
Hanyang University

Choi, Jungzae  
January 5, 2004 – January 31, 2004  
Condensed Matter Physics  
Geimyung University

Kim, Jong Won  
January 5, 2004 – February 21, 2004  
Nonlinear Dynamics of Complex Systems  
MPI-PKS Dresden

Noh, Jae Dong  
January 8, 2004 – February 28, 2004  
Absorbing Critical Phenomena  
Chungnam National University

Umetsu, Keiichi  
January 8, 2004 – January 17, 2004  
CMB Polarization and Gravitational Lensing  
Academia Sinica

Kim, J. H.  
January 9, 2004 – January 10, 2004  
Astrophysics/Cosmology  
Korea Astronomy & Space Science Institute

Takeuchi, Tatsu  
January 11, 2004 – January 14, 2004  
Precision Electroweak Measurements Ad  
New Physics  
Virginia Tech University

## SCHOOL OF PHYSICS

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Hyun, S. J.  
January 12, 2004 – January 17, 2004  
String Theory  
Yonsei University

Kong, Otto  
January 13, 2004 – February 12, 2004  
New Physics beyond Standard Model  
National Central University

Giunti, C.  
January 14, 2004 – January 24, 2004  
Neutrino Physics  
University of Torino

Chang, Kee Joo  
January 26, 2004 – February 21, 2004  
Condensed Matter Physics  
Korea Advanced Institute of Science and  
Technology

Lee, B. H.  
January 26, 2004 – February 28, 2004  
Particle Physics  
Sogang University

Chung, Myung-Hoon  
February 2, 2004 – February 28, 2004  
Field Theory/Many Body Physics  
Hongik University

Kim, H. B.  
February 2, 2004 – February 28, 2004  
Particle Physics and Cosmology  
Hanyang University

Kang, Kicheon  
February 2, 2004 – February 27, 2004  
Condensed Matter Physics  
Chonnam National University

Choi, Young Il  
February 3, 2004 – February 28, 2004  
B Physics Experiment  
Sungkyunkwan University

Anton, Lucian  
February 8, 2004 – February 23, 2004  
Absorbing Phase Transitions  
Institute of Atomic Physics

Sugimoto, S.  
February 11, 2004 – February 18, 2004  
String Theory  
Yukawa Institute

Kim, J. H.  
February 13, 2004 – August 31, 2004  
Astrophysics  
Korea Astronomy & Space Science Institute

Kwon, Sungchul  
February 16, 2004 – February 23, 2004  
Nonequilibrium Phase Transitions  
ITF

Izumida, Wataru  
February 17, 2004 – February 26, 2004  
Condensed Matter Physics  
Tohoku University

Lee, Jungil  
February 21, 2004 – February 27, 2004  
Heavy Quarkonium Physics and Absorptive  
Loop Calculation  
Argonne Laboratory

Dutta, Sreedhar  
March 1, 2004 – May 30, 2004  
Nonequilibrium Statistical Physics  
Tata Institute

## SCHOOL OF PHYSICS

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Greub, Christoph  
March 1, 2004 – March 12, 2004  
Phenomenology  
University of Bern

Tanimoto, Morimitsu  
March 2, 2004 – March 7, 2004  
Phenomenology  
Niigata University

Kaneko, Satoru  
March 2, 2004 – March 7, 2004  
Neutrino Physics  
Niigata University

Yamada, Youichi  
March 4, 2004 – March 14, 2004  
Phenomenology  
Tohoku University

Hou, Wei-Shu  
March 8, 2004 – March 18, 2004  
Phenomenology  
National Taiwan University

Keum, Y. Y.  
March 9, 2004 – March 17, 2004  
Phenomenology  
Nagoya University

Sato, Joe  
March 15, 2004 – March 18, 2004  
Neutrino Physics  
Saitama University

Park, Jaemo  
March 19, 2004 – March 19, 2004  
Matrix Model & Black Hole  
Pohang University of Science and Technology

Choi, Y. Y.  
March 30, 2004 – April 30, 2004  
Large Scale Structure  
Ewha Womans University

Chang, S. H.  
April 19, 2004 – April 23, 2004  
High Energy Particle Phenomenology  
Purdue University

Oreg, Yuval  
April 21, 2004 – April 30, 2004  
Strongly Correlated Electrons in Mesoscopic  
Systems  
Weizmann Institute of Science

Lee, M. Howard  
April 24, 2004 – May 2, 2004  
Statistical Physics  
University of Georgia

Truong, T. N.  
May 2, 2004 – May 23, 2004  
Phenomenology  
Ecole Polytechnique

Shin, Hyunjoon  
May 4, 2004 – May 10, 2004  
String Theory  
Sungkyunkwan University

Tinh, Vo  
May 9, 2004 – May 16, 2004  
Theoretical Physics  
Hue Pedagogical University

Galbaatar, T.  
May 9, 2004 – May 16, 2004  
Theoretical Physics  
Mongolian Academy of Sciences

## SCHOOL OF PHYSICS

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Lee, Y. W. May 17, 2004 – May 23, 2004 Investigation for a Possible Violation of the Gubser-Mitra Conjecture Yonsei University	Kwon, O-Kab June 7, 2004 – July 3, 2004 Field Theory Sungkyunkwan University
Kee, Hae Young May 17, 2004 – May 25, 2004 Solid State Physics University of Toronto	Kosterlitz, Mike June 7, 2004 – July 3, 2004 Phase Transition and Global Optimization Brown University
Kudoh, Hideaki May 22, 2004 – June 4, 2004 Theoretical Physics University of Tokyo	Song, Jaejoon June 10, 2004 – June 19, 2004 Statistical Analysis on Heavy-Ion Collision Pusan National University
Hieu, N. W. May 24, 2004 – May 30, 2004 Particle and Solid State Physics Vietnam Academy of Science and Technology	Fortin, Jean-Yves June 15, 2004 – July 10, 2004 Phase Transitions and Dynamics of Complex Systems University of Louis Pasteur
Gaur, Naveen May 28, 2004 – June 17, 2004 Particle Physics Phenomenology University of Delhi	Park, Jaemo June 17, 2004 – June 17, 2004 Matrix Model of Black Holes Pohang University of Science and Technology
Lee, Y. W. June 2, 2004 – June 8, 2004 Investigation for a Possible Violation of the Gubser-Mitra Conjecture Yonsei University	Choi, Mahn Soo June 21, 2004 – June 26, 2004 Spin-Transport in N/SC/N Junctions Korea University
Scopel, Stefano June 6, 2004 – June 17, 2004 Supersymmetric Dark Matter Torino University	Schomerus, Henning June 26, 2004 – June 26, 2004 Mesoscopic Physics Max Planck Institute
Yajnik, Urjit A. June 6, 2004 – July 17, 2004 Leptogenesis and Grand Unification Indian Institute of Technology	Song, Jeong-hyeon June 28, 2004 – July 22, 2004 Particle Physics Phenomenology Konkuk University



## SCHOOL OF PHYSICS

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Asfandiyarov, Ildar Maratovich July 2, 2004 – July 3, 2004 Astrophysics Ulugh Beg Astronomical Institute	Lee, Y. W. July 26, 2004 – August 25, 2004 Investigation for a Possible Violation of the Gubser-Mitra Conjecture Yonsei University
Ibrahimov, Mansur Akbarovich July 2, 2004 – July 3, 2004 Astrophysics Ulugh Beg Astronomical Institute	Park, Pyeong Jun July 28, 2004 – August 13, 2004 Statistical Physics of Polymers Chungju National University
Aliev, Abbas July 2, 2004 – July 3, 2004 Astrophysics Ulugh Beg Astronomical Institute	Kalinowski, Jan August 2, 2004 – August 13, 2004 Phenomenology of Supersymmetric Standard Model Warsaw University
Lee, Y. W. July 12, 2004 – July 18, 2004 Investigation for a Possible Violation of the Gubser-Mitra Conjecture Yonsei University	Weinberg, Erick August 6, 2004 – August 17, 2004 Particle Physics Columbia University
Rieger, Heiko July 16, 2004 – July 23, 2004 Statistical Physics of Disordered Systems University of Saarlandes	Lee, Hyun-Choel August 18, 2004 – August 27, 2004 Condensed Matter Physics Sogang University
Munoz, Miguel July 16, 2004 – July 17, 2004 Statistical Physics of Reaction Diffusion Systems University of Granada	Ng, K-W August 20, 2004 – August 27, 2004 Astrophysics National Taiwan University
Chate, H. July 20, 2004 – July 23, 2004 Statistical Physics Saclay Corporation	Chang, S. H. August 23, 2004 – August 27, 2004 Particle Physics Yonsei University
Park, Jaemo July 26, 2004 – July 31, 2004 Nonperturbative Aspects of String and M- Theory Pohang University of Science and Technology	Lee, Kang Young August 25, 2004 – August 31, 2004 B-Physics Korea Advanced Institute of Science and Technology

## SCHOOL OF PHYSICS

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Ahn, Eun-Joo  
August 25, 2004 – August 27, 2004  
Particle Astrophysics  
University of Chicago

Furusaki, Akira  
August 29, 2004 – September 10, 2004  
Condensed Matter Physics  
RIKEN

Volkas, Raymond  
August 31, 2004 – September 13, 2004  
Neutrino Physics and Astro-Particle/  
Cosmology  
University of Melbourne

Obara, Midori  
August 31, 2004 – September 5, 2004  
Neutrino Physics  
Ochanomizu

Oshikawa, Masaki  
September 1, 2004 - September 10, 2004  
Condensed Matter Physics  
Tokyo Institute of Technology

Salk, Sung-Ho  
September 1, 2004 – December 31, 2004  
High Tc Superconductivity  
Pohang University of Science and Technology

Oh, John J.  
September 1, 2004 – September 10, 2004  
Stability of Wormhole Solutions  
Ewha Womans University

Kim, Jong Jean  
September 1, 2004 – December 31, 2004  
Condensed Matter physics  
Korea Advanced Institute of Science and  
Technology

Kim, Juhan  
September 1, 2004 – September 25, 2004  
Simulation of Cosmological Structure  
Formation/Theoretical Interpretation of the  
Mass function  
Korea Astronomy & Space Science Institute

Furuta, K.  
September 1, 2004 – September 7, 2004  
Matrix Theory and Noncommutative Field Theories  
National Tsing Hua University

Akeroyd, Andrew  
September 6, 2004 – September 12, 2004  
Phenomenology  
KEK

Drees, Manuel  
September 7, 2004 – October 6, 2004  
Astrophysics and Supersymmetry  
Phenomenology  
Bonn University

Freivogel, Ben  
September 7, 2004 – September 23, 2004  
String Theory  
Stanford University

Truong, T. N.  
September 13, 2004 – October 5, 2004  
Particle Physics  
Ecole Polytechnique

Kleban, M. B.  
September 15, 2004 – September 30, 2004  
String Theory  
Institute for Advanced Study

Martinez, Maria R.  
September 15, 2004 – September 30, 2004  
String Theory  
Hebrew University

## SCHOOL OF PHYSICS

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Hellerman, Simeon September 16, 2004 – September 28, 2004 String Theory Institute for Advanced Study	Lee, M. Howard October 16, 2004 – October 24, 2004 Statistical Physics University of Georgia
Park, Jung-Hyuck September 20, 2004 – September 25, 2004 String Theory Institut des Hautes Etudes Scientifiques	Hwang, J. C. October 17, 2004 – October 21, 2004 Cosmology Kyungpook National University
Song, Chaejun September 20, 2004 – October 29, 2004 Effective Field Theory in High Density Pusan National University	Puetzfeld, Dirk October 17, 2004 – October 21, 2004 Cosmology Iowa State University
Giunti, C. September 26, 2004 – October 25, 2004 Particle Physics Istituto Nazionale di Fisica Nucleare, Sezione di Torino	Umetsu, Keiichi October 22, 2004 – October 28, 2004 Gravitational Lensing Analysis Using Phase-Modulated Filtering Institute of Astronomy and Astrophysics, Academia Sinica
Takeuchi, Tatsu October 3, 2004 – October 13, 2004 Phenomenology Virginia Tech University	Pen, U. October 25, 2004 – October 27, 2004 Astrophysics Canadian Institute For Theoretical Astrophysics
Vento, V. October 5, 2004 – October 30, 2004 Astro-Hadron Physics Valencia University	Sheth, R. October 26, 2004 – November 3, 2004 Astrophysics University of Pennsylvania
Aihara, Masaki October 7, 2004 – October 9, 2004 Optical Properties in Strongly Correlated Systems NARA Institute of Science & Technology	Pen, U. October 27, 2004 – October 31, 2004 Astrophysics Canadian Institute For Theoretical Astrophysics
Hoppe, J. October 14, 2004 – October 22, 2004 String Theory Royal Institute of Technology	Song, Youngho November 1, 2004 – November 5, 2004 Wave Function of HENP Process and Change of Matrix Elements According to Scattering Length

## SCHOOL OF PHYSICS

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Yang, H. S.

November 9, 2004 – November 13, 2004

Quantum Field Theory

Seoul National University

Kim, H. B.

December 13, 2004 – December 31, 2004

Cosmology

Hanyang University

Lee, Jungjai

December 7, 2004 – December 11, 2004

Theoretical Physics

Daejin University

Kim, Kyungkyu

December 16, 2004 – December 24, 2004

String theory

Seoul National University

Hikage, Chiaki

December 9, 2004 – December 14, 2004

Astrophysics/Data Analysis and Consultation on

Sloan Digital Sky Survey/Condensed Matter Physics

Carnegie Mellon University

## SCHOOL OF PHYSICS

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### Research Activities (Workshops, Symposia, Conferences, Seminars, etc.)

#### Workshops/Symposia/Conferences

- The 5th KIAS-SNU Physics Winter Camp (January 5, 2004 ~ January 16, 2004)  
The 8th APCTP-KIAS Winter School on String Theory (February 16, 2004 ~ February 27, 2004)  
KIAS Winter School on Cosmology (February 23, 2004 ~ February 27, 2004)  
The 10th KIAS-APCTP Lectures on Nano-Mesoscopic Systems (May 28, 2004 ~ May 29, 2004)  
The 3rd KAIST-KIAS Joint Workshop on Particle Physics (June 11, 2004 ~ June 17, 2004)  
Nonequilibrium Statistical Physics of Complex Systems: Satellite Meeting of STATPHYS 22 (June 29, 2004 ~ July 2, 2004)  
The 4th Summer Institute for Theoretical Physics (October 10, 2004 ~ October 20, 2004)  
International Conference on Flavor Physics and CP Violation (October 4, 2004 ~ October 9, 2004)  
Trends in Physics, Conference in honor of Prof. C. W. Kim's retirement (October 15, 2004)  
KIAS-Hanayng Joint Workshop on Multifaceted Skyrmions and Effective Field Theory (October 25, 2004 ~ October 27, 2004)  
KIAS International Workshop on Astrophysics (October 28, 2004 ~ October 30, 2004)  
The 11th APCTP-KIAS Lectures on Nano-Mesoscopic Systems (December 17, 2004 ~ December 18, 2004)

#### Seminars

- |   |  |
|---|--|
| January 9, 2004<br>Umetsu, Keiichi (Institute of Astronomy and Astrophysics, Academia Sinica)<br>Astrophysics Group Meeting   | January 15, 2004<br>Lee, Jiwoo (Duke University)<br>Quantum Monte Carlo Method on Solids   |
| January 12, 2004<br>Takeuchi, Tatsu (Virginia Technology)<br>Introduction to the Analysis of Precision Electroweak Measurements   | January 16, 2004<br>NEST Group<br>(Korea Institute for Advanced Study)<br>BA Type Network and its Applications                                       |
| January 13, 2004<br>Umetsu, Keiichi (Institute of Astronomy and Astrophysics, Academia Sinica)<br>Simulation of a Combined SZE and Weak Lensing Cluster Survey for AMiBA Experiment | January 16, 2004<br>Giunti, C. (Torino University)<br>Theory and Phenomenology of Neutrino Mixing and Oscillations I                                 |
| January 14, 2004<br>Yee, Jung-Tay<br>(Korea Institute for Advanced Study/<br>University of Amsterdam)<br>String Interactions in $c=1$ Matrix Model                                  | January 17, 2004<br>KIAS Monthly Meeting on Statistical Physics<br>(Korea Institute for Advanced Study)<br>Critical Phenomena in Scale-Free Networks |

## SCHOOL OF PHYSICS

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January 19, 2004 Giunti, C. (Torino University) Theory and Phenomenology of Neutrino Mixing and Oscillations II	February 13, 2004 Sugimoto, Shigeki (Yukawa Institute) The Schwinger Model and String Theory
January 20, 2004 Giunti, C. (Torino University) Theory and Phenomenology of Neutrino Mixing and Oscillations III	February 13, 2004 Kang, Kicheon (Chonnam National University) Detection of Geometric Phases in Superconducting Nanocircuits
January 26, 2004 Choi, Yun-Young (Ewha Womans University) Cosmological Evolution Models for QSO Luminosity Functions	February 13, 2004 Kang, Gung Won (Korea Institute for Advanced Study) Astrophysics Group Meeting
January 30, 2004 Kim, Jong Won (Max-Planck-Institut für Physik Komplexer Systeme) Front Propagation of Spatiotemporal Chaos	February 13, 2004 NEST Group (Korea Institute for Advanced Study) Sandpile Models with Critical Height
January 30, 2004 Kong, Otto (National Central University of Taiwan) Little Higgs Models as TeV Scale Effective Field Theories	February 19, 2004 Kwon, Sungchul (Institut für Festkörperforschung, Jülich) Generalized Scaling Relations for Unidirectionally Coupled Nonequilibrium Systems
January 30, 2004 NEST Group (Korea Institute for Advanced Study) NEST Group Meeting	February 20, 2004 Chun, Eung Jin (Korea Institute for Advanced Study) Curvaton and QCD Axion in Supersymmetric Theories
January 31, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting	February 20, 2004 NEST Group (Korea Institute for Advanced Study) Approach to Asymptopia in the Dynamics of the Trapping Reaction
February 6, 2004 Oh, M. C. (Seoul National University) Neutrino Mass Zeros from Triplet VEV	February 20, 2004 Izumida, W. (Tohoku University) Many-Body Effects in Tunneling through Quantum Dots and Carbon Nanotubes

## SCHOOL OF PHYSICS

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February 24, 2004 Chun, Eung Jin (Korea Institute for Advanced Study) Cosmology: Questions and Answers	March 5, 2004 Dutta, Sreedhar (Tata Institute of Fundamental Research) Phase Transitions in Periodically Driven Macroscopic Systems
February 25, 2004 Chun, Eung Jin (Korea Institute for Advanced Study) Cosmology: Questions and Answers	March 9, 2004 Greub, Christoph (University of Bern) Inclusive Rare B Decays
February 26, 2004 Chun, Eung Jin (Korea Institute for Advanced Study) Cosmology: Questions and Answers	March 9, 2004 Jeong, Daun (Seoul National University) Ising Models on a Small-World Network
February 27, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting	March 10, 2004 Yamada, Youichi (Tohoku University) $b \rightarrow s$ Gamma in SUSY Models with Large Tan Beta
February 27, 2004 Chun, Eung Jin (Korea Institute for Advanced Study) Cosmology: Questions and Answers	March 11, 2004 Hou, George W. S. (National Taiwan University) Implications of $B \rightarrow \phi K_s$ Anomaly for Super B Factory and Colliders
March 3, 2004 Tanimoto, Morimitsu (Niigata University) Prediction of $Ue3$ and Flavour Symmetry	March 12, 2004 NEST Group (Korea Institute for Advanced Study) Models of Diffusion/Aggregation/ Fragmentation
March 4, 2004 Kaneko, Satoru (Niigata University ) Texture Zero of Neutrino Mass Matrix and Leptogenesis	March 16, 2004 Sato, Joe (Saitama University) Lepton Flavor Violation Inlong-Baseline Experiments
March 5, 2004 Nam, Soonkeon (Kyung Hee University) Lecture on Integrability	March 17, 2004 Hou, George W. S. (National Taiwan University) The NuTel Project and Future of Very High Energy Neutrino Astrophysics
March 5, 2004 NEST Group (Korea Institute for Advanced Study) Sandpile Models with Critical Height II	

## SCHOOL OF PHYSICS

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March 19, 2004 NEST Group (Korea Institute for Advanced Study) Scale-Free Network on a Vertical Plane	April 9, 2004 Yee, Ho-Ung (Korea Institute for Advanced Study) Covariant Entropy Bound and Its Dimensional Reduction
March 20, 2004 KIAS Monthly Meeting on Statistical Physics (Korea Institute for Advanced Study) Collapse of a Polysoap	April 9, 2004 NEST Group (Korea Institute for Advanced Study) Correlations in Networks associated to Preferential Growth
March 24, 2004 Yi, Piljin (Korea Institute for Advanced Study) Tachyon & a Global View on String Theory	April 9, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting
March 26, 2004 Hikida, Yasuaki (Seoul National University) Can Branes Travel beyond CTC Horizon in Goedel Universe?	April 14, 2004 Chang, Kee Joo (Korea Advanced Institute of Science and Technology) Magnetism in Fullerenes and Carbon Nanotube Hybrid Systems
March 26, 2004 Park, Seong Chan (Korea Institute for Advanced Study) Astrophysics Group Meeting	April 16, 2004 Raeymaekers, Joris (Korea Institute for Advanced Study) Topics in Closed String Tachyon (II)
March 26, 2004 NEST Group (Korea Institute for Advanced Study) In-Out Model and Its Related Models	April 16, 2004 NEST Group (Korea Institute for Advanced Study) Cluster Mean Field
April 2, 2004 Yi, Piljin (Korea Institute for Advanced Study) Topics in Closed String Tachyon (I)	April 16, 2004 Park, Seong Chan (Korea Institute for Advanced Study) Phenomenology Journal Club Meeting
April 2, 2004 NEST Group (Korea Institute for Advanced Study) Anisotropic Growth Model	April 21, 2004 Kahng, Byung nam (Seoul National University) Complex Networks: Structure and Dynamics
April 7, 2004 Kim, Hyung Do (Seoul National University) Fun with Extra Dimensions	



## SCHOOL OF PHYSICS

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April 22, 2004 Chang, Sanghyeon (Yonsei University) Phenomenology Journal Club Meeting	May 7, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting
April 23, 2004 ODSS Group (Korea Institute for Advanced Study) ODSS Group Meeting	May 7, 2004 NEST Group (Korea Institute for Advanced Study) Modulated Scale-Free Network in Euclidean Space
April 23, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting	May 7, 2004 Lyo, S. K. (Sandia National Laboratories) Thermoelectric Power from 3D Metals to 1D Nano-Wires: Electron-Phonon Interaction
April 26, 2004 Oreg, Y. (Weizmann Institute) Breakdown of Fermi Liquid Theory in a Modified Single Electron Transistor	May 7, 2004 Choi, Soo Kyung (Kyeongsang National University) Properties of X
April 27, 2004 Park, Hyunggyu (Korea Institute for Advanced Study) Cluster Mean Field	May 7, 2004 ODSS Group (Korea Institute for Advanced Study) ODSS Group Meeting
April 28, 2004 Lee, M. Howard (University of Georgia) Love in van der Waals Equation	May 13, 2004 Truong, Tran N. (Ecole Polytechnique ) Improvement of (Chiral) Perturbation Theory
April 30, 2004 Condensed Matter Group Meeting (Korea Institute for Advanced Study) Condensed Matter Group Meeting	May 14, 2004 NEST Group (Korea Institute for Advanced Study) Integration of Langevin Equations with Multiplicative Noise and Viability of Field Theories for Absorbing Phase Transitions
April 30, 2004 NEST Group (Korea Institute for Advanced Study) Dynamical Ensembles in Nonequilibrium Statistical Mechanics	May 14, 2004 Park, Jaesuk (Graduate Center, City University of New York) Quantum Dynamics on Moduli Space of QFTs
May 4, 2004 Kim, Yong W. (Lehigh University/ Seoul National University) 1/f Dynamics of Granular Avalanches	

## SCHOOL OF PHYSICS

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May 19, 2004 Lee, Hyun-Cheol (Sogang University) One-Dimensional SU(4) Hubbard Model	May 28, 2004 NEST Group (Korea Institute for Advanced Study) Enhancement of Coherent Response by Quenched Disorder
May 19, 2004 Lee, Myung Gyoon (Seoul National University) Formation and Evolution of Galaxies	June 1, 2004 Kudoh, Hideaki (Tokyo University) Blackholes with Extra Dimension - the Evidence for the BH , Black String Phase Transition
May 20, 2004 Kim, Eugene (University of Windsor) Kondo Effect in Quantum Dots coupled to Luttinger Liquid Leads	June 4, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting
May 21, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting	June 4, 2004 ODSS Group (Korea Institute for Advanced Study) Optical Digital Sky Survey Meeting
May 24, 2004 Kim, Ki-Seok (Korea Institute for Advanced Study) Quantum Phase Transitions in D-wave Superconductors from Doped Mott Insulator: U(1) Gauge Theory	June 11, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting
May 25, 2004 Dutta, Sreedhar B. (Korea Institute for Advanced Study/Tata Institute of Fundamental Research) Entropy I	June 11, 2004 Shin, Hyeonjoon (Sungkyunkwan University) Comments on Fuzzy Sphere Dynamics in the PP-Wave Matrix Model
May 27, 2004 Dutta, Sreedha (Korea Institute for Advanced Study/Tata Institute of Fundamental Research) Entropy II	June 11, 2004 NEST Group (Korea Institute for Advanced Study) NEST Group Meeting
May 28, 2004 Hashimoto, Koji (Tokyo University) Death of Open Strings in Brane Decay	June 11, 2004 ODSS Group (Korea Institute for Advanced Study) Optical Digital Sky Survey Meeting

## SCHOOL OF PHYSICS

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June 16, 2004 Hong, Seung Soo (Seoul National University) Exoplanets and Exoplanetary Systems	July 16, 2004 NEST Group (Korea Institute for Advanced Study) A Network Model for Growing Internet Community
June 23, 2004 Son, Dongchul (Kyungpook National University, CHEP) High Energy Physics and GRID	July 16, 2004 ODSS Weekly Meeting (Korea Institute for Advanced Study) Early Type Galaxies in the Sloan Digital Sky Survey
June 24, 2004 Jean-Yves Fortin (University of Louis Pasteur) De Haas-Van Alphen Frequency Combinations due to Chemical Potential Oscillations in an Idealized Two-band Fermi Liquid	July 21, 2004 Rieger, Heiko (University of Saarlandes) Disordered systems/Ground states/ Combinatorial Optimization
June 28, 2004 Ahn, Sang-Hyeon (Korea Institute for Advanced Study) Meteoric Activities during the Last Two Millennia Extracted from Meteor Records in Ancient Chronicles	July 22, 2004 Chate, Hugues (CEA Saclay) Moving and Staying Together without a Leader : Minimal Ingredients for Collective and Cohesive Motion
June 29, 2004 Yajnik, U. (Indian Institute of Technology) Alternative Scenarios for Baryogenesis	July 23, 2004 NEST Group (Korea Institute for Advanced Study) Recent Studies Related to Random Network
June 29, 2004 Han, Jung Hoon (Sungkyunkwan University) Ground States of Quantum Antiferromagnets in Two Dimensions	July 23, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting
July 2, 2004 Ibrahimov, M. A. (Maidanak High Altitude Observatory, Ulugh Beg Astronomical Institute) Astrophysics Group Meeting	July 23, 2004 SDSS-KSG Group (Korea Institute for Advanced Study) SDSS-KSG Group Weekly Meeting
July 9, 2004 Choi, Yun-Young (Korea Institute for Advanced Study) The 2nd SDSS- Korea Science Group Meeting	July 28, 2004 Schwarz, Albert (University of California, Davis) Noncommutative Supergeometry and Maximally Supersymmetric Gauge Theories

## SCHOOL OF PHYSICS

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July 28, 2004

Park, Wan-Il (Korea Advanced Institute  
of Science and Technology)

Low Energy Affleck-Dine Leptogenesis  
Compatible with Thermal Inflation

July 30, 2004

Hong, Deog Ki (Pusan National University)  
Composite Higgs from Higgs Representations

August 5, 2004

Kalinowski, Jan (Warsaw University)  
Large Mixing in the CP violating Higgs Sector

August 6, 2004

NEST Group  
(Korea Institute for Advanced Study)  
Directed Fixed Energy Sandpile Model

August 6, 2004

SDSS-KSG Group  
(Korea Institute for Advanced Study)  
SDSS-KSG Group Weekly Meeting

August 13, 2004

NEST Group  
(Korea Institute for Advanced Study)  
Roughness of Sandpile Surfaces

August 16, 2004

Weinberg, Erick (Columbia University)  
New Bounce Solutions and Vacuum  
Tunneling in de Sitter Spacetime

August 20, 2004

SDSS-KSG Group  
(Korea Institute for Advanced Study)  
SDSS-KSG Weekly Meeting

August 23, 2004

Newberg, Heidi  
(Rensselaer Polytechnic Institute)  
Galaxy Formation

August 23, 2004

Ahn, Eun-Joo (University of Chicago)  
Experimental Quantum Gravity with Cosmic  
Ray Air Shower

August 25, 2004

Bak, Dongsu (University of Seoul)  
Supertube Microstates

August 25, 2004

Ng, Kin-Wang  
(Institute of Physics, Academia Sinica)  
Quintessence and Time-Varying Alpha

August 27, 2004

Ng, Kin-Wang  
(Institute of Physics, Academia Sinica)  
Astrophysics Group Meeting

August 27, 2004

SDSS-KSG Group  
(Korea Institute for Advanced Study)  
SDSS-KSG Weekly Meeting

September 1, 2004

Obara, Midori (Ochanomizu University)  
Symmetric Mass Matrix with Two Zeros in  
SUSY SO(10) GUT, Lepton Flavor  
Violation and Leptogenesis

September 2, 2004

Kim, Seok  
(Korea Institute for Advanced Study)  
String Journal Club Meeting: Bena and  
Warner Paper hep-th, 0408106

September 3, 2004

Volkas, Raymond  
(The University of Melbourne)  
Trying to Understand the Neutrino Mixing  
Matrix Using Flavour Symmetries

## SCHOOL OF PHYSICS

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September 3, 2004 Yuriy A. Kosevich (IICO-UASLP Mexico/ Max Plank Institute at Dresden) Re-Evaluation of the Crossover from Elastic to Capillary Surface Waves on Soft Polymer Gels and Some Other Problems of Collective Dynamics	September 9, 2004 String Theory Group (Korea Institute for Advanced Study) String Theory Group Meeting
September 3, 2004 NEST Group (Korea Institute for Advanced Study) Queuing Transitions in a 1D RSOS Model	September 10, 2004 Volkas, Raymond (University of Melbourne) Clash of Symmetries on the Brane
September 7, 2004 Oshikawa, Masaki (Tokyo Institute of Technology) Junctions of Three Quantum Wires and Boundary Conformal Field Theory	September 10, 2004 Kim, Chunglee (Northwestern University) The Galactic Inspiral Rate of Double-Neutron -Star Systems and Expectation
September 7, 2004 Park, Jaemo (Pohang University of Science and Technology) Quantum Background Independence in String Theory	September 10, 2004 Astrophysics Group (Korea Institute for Advanced Study) Astrophysics Group Meeting
September 7, 2004 Furuta, K. (National Tsing Hua University) Density Perturbation in Ekpyrotic Scenario	September 10, 2004 NEST Group (Korea Institute for Advanced Study) NEST Group Meeting
September 8, 2004 Volkas, Raymond (University of Melbourne) Environmental Decoherence: from Neutrino Oscillations to Quantum Computation	September 16, 2004 Drees, Manuel (Bonn University) Leptogenesis from an Oscillating Neutrino Condensate
September 8, 2004 Furusaki, Akira (RIKEN) Various Insulating Phases in One-Dimensional Interacting Electron Systems	September 17, 2004 NEST Group (Korea Institute for Advanced Study) A Simulated Annealing Method for Random- Band Ising Model?
September 9, 2004 Volkas, Raymond (University of Melbourne) Introduction to Sterile Neutrinos	September 17, 2004 Drees, Manuel (Bonn University) Singlet Sneutrinos as Simultaneous Source of the Baryon Asymmetry/Dark Matter/Structure Formation

## SCHOOL OF PHYSICS

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September 20, 2004 Hellerman, Simeon (Institute for Advanced Study) The Landscape of Superstring Theory in $D > 10$	October 12, 2004 Lyo, In-Whan (Yonsei University) Metal-Insulator Transition in a Nanowire Array
September 21, 2004 Park, Jeong-Hyuck (Institut des Hautes Etudes Scientifiques) Superfield Theory and Supermatrix Model	October 14, 2004 Giunti, Carlo (Istituto Nazionale di Fisica Nucleare, Sezione di Torino/Universita di Torino) Status of Neutrino Masses and Mixing
September 23, 2004 Park, Jeong-Hyuck (Institut des Hautes Etudes Scientifiques) Noncentral Extension of AdS Superalgebra	October 18, 2004 Hoppe, Jens (Royal Insitute for Technology) Spinning Membranes
September 23, 2004 Kyaee, Bumseok (Korea Institute for Advanced Study) Particle Phenomenology Group Journal Club	October 19, 2004 Condensed-Matter Group (Korea Institute for Advanced Study) Condensed-Matter Group Meeting with Prof. Howard Lee
October 7, 2004 Suyama, T., Yee, Ho-Ung (Korea Institute for Advanced Study) Reviews of Berenstein paper and Lin, Lunin, Maldacena Paper	October 19, 2004 Vento, Vicente (University of Valencia) Why are Pentaquarks Exciting ?
October 8, 2004 NEST Group (Korea Institute for Advanced Study) Asymmetric Simple Exclusion Processes with Diffusive Bottlenecks	October 20, 2004 Puetzfeld, Dirk (Iowa State University) Recent Developments in Cosmology – The Search for a Gravitational Solution of the Dark Matter and Dark Energy Problem
October 8, 2004 Aihara, Masaki (NARA Institute of Science and Technology) Optically Excited States in Strongly Correlated Electron Systems	October 27, 2004 Kim, Mun Dae (Korea Institute for Advanced Study) Double-well Potentials and Qubit Coupling by a Connecting Loop in Josephson Current Qubits
October 11, 2004 Takeuchi, Tatsu (Virginia Tech University) Phenomenological Consequences of the Minimal Length Uncertainty Relation	October 29, 2004 NEST Group (Korea Institute for Advanced Study) NEST Group Meeting

## SCHOOL OF PHYSICS

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November 3, 2004 Wang, Jun-Pin (Pohang University of Science and Technology) Topological Structures in Bose-Einstein Condensates	November 23, 2004 Yee, Ho-Ung (Korea Institute for Advanced Study) Review of "Phases of N=2 Theories in 2 Dimensions" (Part II)
November 4, 2004 Raeymaekers, Joris (Korea Institute for Advanced Study) Review of Paper by Dabholkar, A.	November 25, 2004 Scopel, Stefano (Korea Institute for Advanced Study) Review of "Neutrino Models of Dark Energy" by Peccei, R. D.
November 4, 2004 Okamura, Naotoshi (Korea Institute for Advanced Study) Particle Phenomenology Group Journal Club	November 25, 2004 Yee, Ho-Ung (Korea Institute for Advanced Study) Review of "Phases of N=2 Theories in 2 Dimensions" (Part III)
November 5, 2004 NEST Group (Korea Institute for Advanced Study) NEST Group Meeting	November 26, 2004 Kim, Seok (Korea Institute for Advanced Study) String Theory Journal Club
November 11, 2004 Park, Jae-hyeon (Korea Institute for Advanced Study) Particle Phenomenology Group Journal Club	November 26, 2004 The 3rd SDSS Korea Science Group (Korea Institute for Advanced Study) The 3rd SDSS Korea Science Group Meeting
November 18, 2004 Park, Seong Chan (Korea Institute for Advanced Study) Particle Phenomenology Group Journal Club	November 26, 2004 NEST Group (Korea Institute for Advanced Study) Monte Carlo Simulations of the Rise and the Fall of Languages
November 19, 2004 Yee, Ho-Ung (Korea Institute for Advanced Study) Review of "Phases of N=2 Theories in 2 Dimensions" (Part I)	December 3, 2004 NEST Group (Korea Institute for Advanced Study) NEST Group Meeting
November 19, 2004 NEST Group (Korea Institute for Advanced Study) NEST Group Meeting	December 8, 2004 Moon, Hie Tae (Korea Advanced Institute of Science and Technology) Poincare and Beyond the Limits

## SCHOOL OF PHYSICS

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|--|--|
| December 9, 2004<br>Oh, Myoung Chu (Yonsei university)<br>Review of "Leptonic CP Violation Phases Using an Ansatz for the Neutrino Mass Matrix and Application to Leptogenesis," hep-ph, 0402176 | December 18, 2004<br>KIAS Monthly Meeting on Statistical Physics (Korea Institute for Advanced Study)<br>Physical Model for T cell Immune Response   |
| December 10, 2004<br>NEST Group<br>(Korea Institute for Advanced Study)<br>NEST Group Meeting  | December 20, 2004<br>Kim, Mun-Dae<br>(Korea Institute for Advanced Study)<br>Persistent Currents in Aharonov-Bohm Rings with Impurities  |
| December 10, 2004<br>Astrophysics Group<br>(Korea Institute for Advanced Study)<br>Astrophysics Group Meeting  | December 20, 2004<br>Kim, Ki-Seok<br>(Korea Institute for Advanced Study)<br>Deconfined Quantum Critical Point of the O(3) Non-Linear sigma Model in Two Spatial Dimensions: a Renormalization Group study |
| December 10, 2004<br>Astrophysics Group Meeting<br>(Pennsylvania State University)<br>Artificial Atoms of Composite Fermions   | December 22, 2004<br>Kim, Choong Sun (Yonsei University)<br>A Few Hot Topics in CPV  |
| December 16, 2004<br>Chun, Eung Jin<br>(Korea Institute for Advanced Study)<br>Particle Phenomenology Group Journal Club   | December 23, 2004<br>Choi, Mahn-Soo (Korea University)<br>SU(4) Kondo Effect in Carbon Nanotubes   |
| December 17, 2004<br>Han, Jung Hoon (Sungkyunkwan University)<br>Lattice-Coupled Antiferromagnet on Frustrated Lattices  |  |



## SCHOOL OF PHYSICS

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### Publications

Ahn KH, Yi HM

Elementary excitations in one-dimensional electromechanical systems; transport with back-reaction

EUROPHYSICS LETTERS 67 (4): 641-647 AUG 2004

Ahn SH

Singly peaked asymmetric Ly alpha from starburst galaxies

ASTROPHYSICAL JOURNAL 601 (1): L25-L28 Part 2 JAN 20 2004

Akeroyd AG

Effect of  $H_{\pm}$  on  $D_{\pm} \rightarrow \mu_{\pm} \nu(\mu)$  and  $D_{\pm} \rightarrow \tau_{\pm} \nu(\tau)$

PROGRESS OF THEORETICAL PHYSICS 111 (2): 295-299 FEB 2004

Akeroyd AG, Chun EJ, Diaz MA, Jung DW

Neutrino masses, baryogenesis and bilinear R-parity violation

PHYSICS LETTERS B 582 (1-2): 64-72 FEB 26 2004

Akeroyd AG, Diaz MA, Pacheco FJ

Double fermiophobic Higgs boson production at the CERN LHC and a linear collider

PHYSICAL REVIEW D 70 (7): Art. No. 075002 OCT 2004

Baek S

A two-loop contribution to  $B_{\pm} \rightarrow \mu^{+} \mu^{-}$  at large tan beta in the MSSM

PHYSICS LETTERS B 595: 461-468 AUG 12 2004

Bak D, Rey SJ, Yee HU

Exactly soluble dynamics of (P,Q) string near macroscopic fundamental strings

JOURNAL OF HIGH ENERGY PHYSICS 0412: 008 DEC 2004

Bak D, Yee HU

Holography, dimensional reduction and the Bekenstein bound

JOURNAL OF HIGH ENERGY PHYSICS (4): Art. No. 061 APR 2004

Bernier JS, Chung CH, Kim YB, Sachdev S

Planar pyrochlore antiferromagnet: A large-N analysis

PHYSICAL REVIEW B 69 (21): Art. No. 214427 JUN 2004

Borzumati F, Greub C, Yamada Y

Beyond leading-order corrections to  $\overline{B} \rightarrow X \gamma$  at large tan beta: The charged-Higgs-boson contribution

PHYSICAL REVIEW D 69 (5): Art. No. 055005 MAR 1 2004

## SCHOOL OF PHYSICS

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Borzumati F, Lee JS, Song WY

Threshold corrections to  $m(b)$  and the  $b(b)\text{-over-bar} \rightarrow H\text{-i}(0)$  production in CP-violating SUSY scenarios

PHYSICS LETTERS B 595: 347-358 AUG 12 2004

Brahmachari B, Chun EJ

Supersymmetric threshold corrections to  $\Delta m(\text{circle dot})(2)$

PHYSICS LETTERS B 596 (3-4): 184-190 AUG 26 2004

Brown GE, Grandchamp L, Lee CH, Rho M

Nature of the chiral restoration transition in QCD

PHYSICS REPORTS-REVIEW SECTION OF PHYSICS LETTERS 391 (3-6): 353-361 MAR 2004

Brown GE, Lee CH, Rho M, Shuryak E

The  $(q)\text{-over-bar-q}$  bound states and instanton molecules at  $T \geq T_c$

NUCLEAR PHYSICS A 740 (1-2): 171-194 AUG 9 2004

Brown GE, Lee CH, Rho M, Shuryak E

The anti- $q$   $q$  bound states and instanton molecules at  $t \gg t_c$ .

NUCLEAR PHYSICS A740:171-194 2004

Brown GE, Rho M

Double decimation and sliding vacua in the nuclear many body system

PHYSICS REPORTS-REVIEW SECTION OF PHYSICS LETTERS 396:1-39 2004

Brown GE, Rho M

Matching the QCD and hadron sectors and medium-dependent meson masses; hadronization in relativistic heavy ion collisions

PHYSICS REPORTS-REVIEW SECTION OF PHYSICS LETTERS 398 (4-6): 301-325 SEP 2004

Choi MY, Choi J, Yoon BG

Dynamic model of fiber bundles

EUROPHYSICS LETTERS 66 (1): 62-68 APR 2004

Choi MY, Kim BJ, Yoon BG, Park H

Scale-free dynamics emerging from information transfer

EUROPHYSICS LETTERS 69 (4), 503 JAN 14 2005

Choudhury SR, Cornell AS, Joshi GC, McKellar BHJ

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## SCHOOL OF PHYSICS

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Lee J

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## SCHOOL OF COMPUTATIONAL SCIENCES

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### *School of Computational Sciences*

KIAS takes leadership in Computational Sciences in Korea. Discipline of Computational Sciences is a multi-disciplinary effort to do science either using or regarding computational means in addition to purely theoretical means. KIAS School of Computational Sciences comprises nanoelectronics, computational biology, nanomaterials, quantum information science, and computational mathematics. In 2004, while Prof. Hyungju Park joined the School of Computational Sciences as a new faculty member, Dr. Jawoong Lee and Dr. Yong-Hoon Kim as KIAS Assistant Professors, and Dr. Sergey Podoshvedov, Dr. Hyung-Rae Kim, and Dr. Kyung Jin Choi as Research Fellows, Dr. Soojoon Lee and Dr. Wuyun Quan left the School to assume professorships at Kyunghee University and Fudan University, respectively. With expanding computational facilities and acquiring excellent researchers, KIAS School of Computational Sciences keeps growing in hardware, software and “humanware” since its official launching in 2003.

#### **Faculty**

Professor Choi, Hyoung Joon	<i>Physical Properties of Materials &amp; Nanostructures</i>
Professor Kim, Dae Mann	<i>Micro- and Nano-electronic Devices</i>
Professor Kim, Jaewan	<i>Quantum Computation and Information</i>
Professor Lee, Jooyoung	<i>Protein Folding and Global Optimization</i>
Professor Nguyen, Ba An	<i>Nonlinear and Quantum Optics</i>
Professor Park, Hyungju	<i>Symbolic Computation and Signal Processing</i>

#### **Research Fellows**

KIAS Assistant Professor Kim, Yong-Hoon	<i>Multi-scale Nano-device Simulation</i>
KIAS Assistant Professor Tarakeshwar, P.	<i>Computational Chemistry</i>
KIAS Assistant Professor Lee, Jawoong	<i>Nano-devices Modeling</i>
Dr. Choi, Sung Woo	<i>Geometric Modeling &amp; Computer Graphics</i>
Dr. Choi, Kyung Jin	<i>Mathematical Finance</i>
Dr. Kim, Hyung-Rae	<i>Protein Folding</i>
Dr. Kim, Seung-Yeon	<i>Protein Folding and Condensed Matter Theory</i>
Dr. Koh, Eunhee	<i>Theoretical Biology &amp; Harmonic Analysis</i>
Dr. Kwon DoYong	<i>Symbolic Dynamics</i>
Dr. Lee, Kyoungrim	<i>Protein Folding</i>
Dr. Lee, Eunjeong	<i>Cryptography</i>
Dr. Maksimiak, Katarzyna	<i>Protein Folding</i>
Dr. Oh, Sangchul	<i>Quantum Information and Computation</i>
Dr. Podoshvedov, Sergey	<i>Quantum Optics and Quantum Information</i>
Dr. Song MeeKyung	<i>Protein Folding</i>

### **Nanoelectronics**

The data acquisition system installed at KIAS has been utilized extensively this year for characterizing, modeling and simulating flash floating gate and SONOS EEPROM cells. The work was performed as a part of ongoing collaboration between KIAS and Samsung for developing the state of the art non-volatile memory devices. Significant progress was also made in the modeling and simulation of quantum wire FETs.

Prof. Dae Mann Kim was an invited speaker at Symposium at German Academy of Sciences in Berlin for promoting the exchange programs between Korean and German Academy of Science and Symposium by Semicon, Korea. He is a member of Executive Committee of National Center for Nanomaterial and Technology, POSTECH and serves as a reviewer for Journal of Applied Physics, Applied Physics Letters, IEEE Electron Device Letters. He presented 10 lecture series on nano-CMOS devices in department of Nanotechnology, Sungkyunkwan University.

Dr. Jawoong Lee researched on multiple scattering effects in nanowire transistors operating in quasiballistic regime, together with Professor Dae Mann Kim. They newly developed a bidirectional Poisson random process formulation to accommodate both forward and backward scattering of carriers in the channel, and to evaluate accurately a key system parameter, namely the carrier transit time. The transit time thus evaluated is shorter than the previous result by a factor up to 3.

Dr. Tarakeshwar has been working on theoretical investigations of clusters in addition to the work on quantum-chemical investigations of metal-carbon nanotube contacts being undertaken in collaboration with Professor Dae Mann Kim. Clusters are important because they provide a bridge between the limits of isolated atoms and molecules and bulk matter, enable one to understand nucleation at an atomistic level, and provide a fundamental understanding of the properties, particularly the chemical reactivity, of metal clusters. The latter is one of the main reasons for our interest in clusters:--knowledge of the structure-reactivity relationship is useful in the fabrication of structures and devices on the molecular scale.

### **Computational Biology**

The main research activities of protein folding group led by Prof. Jooyoung Lee are three-fold.

#### (1) Protein Structure Prediction and Bioinformatics

As functions of proteins are known to be associated with their unique three-dimensional structures, understanding the protein structures is crucial in biological sciences. Unfortunately, the full three-dimensional structure is known only for far less than 1% of the proteins whose amino acid sequences are realized. Therefore, predicting the structure of a protein solely from its amino acid sequence is the most important problem in structural genomics and proteomics. We use BLAST (basic local alignment search tool), neural network, and CSA (conformational space annealing) to predict protein structures. We have participated in CASP6 (sixth meeting on the critical assessment of techniques for protein structure prediction), the famous international competition for protein structure prediction, and have achieved the elite membership among the CASP6 participants.

(2) Protein Folding

Even after extensive investigations both experimentally and theoretically, the understanding of protein folding (How does a protein fold into its unique three-dimensional structure from only its one-dimensional sequence?) is far from being complete. Recently, we proposed an atomistic potential that was specifically optimized to study a few small proteins for the study of the protein folding. This potential is much more useful for the study of protein folding in that all possible interactions are included. From this study, we conclude that the way a protein folds into its unique three-dimensional structure is determined by the convergence point of early folding trajectories relative to the native state. The results agree well with those in the literature and provide new insights on the protein folding.

(3) Protein Docking

Proteins can be complexed with small organic molecules and other proteins to regulate or control many biological processes. It is quite important to know the 3-D structures of the protein complexes to understand their specific functions and roles in biological systems. Docking is a term used for computational schemes that attempt to find the “best” matching between two molecules: a receptor and a ligand. The conformational variables considered in this problem are three relative translations and three rotations, and the number of interesting rotatable bonds if the flexibility of the molecules is considered. We have employed “Conformational Space Annealing” (CSA) to find the best association of the docking molecules composed of the receptor (proteins) and the ligand (small molecules or proteins). The application of CSA to the docking problems shows that the CSA method is quite efficient and promising to find the native complex structures of the complexes. Especially, for the protein-protein docking, we have participated in “the Critical Assessment of Prediction of Interactions” (CAPRI) and our prediction of the complex structures was quite acceptable. We also learned that inclusion of bioinformatics-based energy terms into the score function can lead to more successful application of CSA to the docking problem.

**Nanomaterials**

Prof. Hyoung Joon Choi investigated electronic structures of carbon nanotubes and fullerenes and developed a computational method for the nonlinear electrical transport in nanostructures. (1) Scanning tunneling microscopy (STM) and spectroscopy (STS) are simulated for a carbon-nanotube intramolecular junction and the simulational results are compared with experimental data to investigate the atomic and electronic structures of the carbon-nanotube junction. In this study, it is concluded that a 5-7 pair is the most dominant defect at the junction. (2) Electronic structures of potassium-doped  $C_{60}$  monolayers on Ag (111) and (100) surfaces are studied by first-principles calculations and angle-resolved photoemission spectroscopy. It is found that the LUMO-derived energy-band dispersion is very different in the monolayers on the two surfaces, and it is concluded that the origin of the difference is the difference of  $C_{60}$  molecular orientations in the two monolayers. (3) Structures and electronic structures of  $K_3C_{60}$  monolayers are further studied by first-principles calculations. It is found that the doped potassium atoms undergo structural phase transitions as the  $C_{60}$  lattice is expanded. In each phase, the doped potassium atoms have different effects on the electronic structures of the monolayers. (4) A first-principles method is developed

## SCHOOL OF COMPUTATIONAL SCIENCES

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for the nonlinear electrical transport in nanostructures and tested with simple systems. The method is suitable for the calculation of current-voltage characteristics of carbon nanotubes and molecular electronic devices.

Dr. Yong-Hoon Kim performed computational research on the characteristics of several molecular electronic devices. Particularly, in collaboration with the Prof. Goddard group at Caltech, Dr. Kim studied the switching mechanism of the electronic device based on [2]catenane and [2]rotaxane molecules, a prime example of combination of advanced supramolecule chemistry and device manufacturing technique. While it was hailed as the state-of-the-art example of molecular electronics, the validity of the experiment was recently questioned. This situation was due to the lack of the theoretical understanding of the switching mechanism in the complex device structure. They successfully identified the switching origin and provided design principles for future molecular electronics research.

### **Quantum Information Science**

Quantum Information Science studies new paradigm of computation and communication which transcends the classical or digital computation and communication in capability and security. It also reconsiders the very fundamentals of quantum mechanics and information science. KIAS School of Computational Sciences took the leadership in Quantum Information Science in Korea. Prof. Jaewan Kim is the director of government projects: “Quantum Information Science” pure basic research group funded by Korea Ministry of Education and “Quantum Cryptography” funded by Korea Ministry of Science and Technology. KIAS-KAIST International Workshop on Quantum Information Science was held in KIAS and C. H. Bennett(IBM), J. Gruska(U Masaryk), R. Jozsa(U Bristol), Jaw-Shen Tsai(NEC), and S. Takeuchi(Hokkaido U) were invited to give talks. Dr. Xiang-Bin Wang(ERATO-JST) was invited to give series of lectures on various topics on quantum communications.

Prof. Jaewan Kim and Dr. Soojoon Lee studied the utilization of entanglement swapping to secure multiparty quantum communication. Prof. Kim’s study on quantum holography proposes a novel hologram using quantum entanglements. Dr. Podoshvedov and Prof. Kim study how to utilize various entanglements of photons for controlled sign gates, quantum channels or a new type of lithography. Prof. Ba An Nguyen extended the study of trio coherent state and proposed ‘quantum dialogue.’ Prof. Nguyen and Prof. Kim produced a KAIST Ph.D., Dr. Hyo S. Yi with the study of ‘Trio Coherent State.’ Prof. Nguyen is taking a leadership to establish the research activity on quantum information science in Vietnam and organized international workshops on quantum information science in Hanoi. Dr. Sangchul Oh studied the entanglement of electron spins in many-body systems using Green’s function approach and found the relation between measure of entanglement and temperature of the system. He also found the environment can play the role of decoherence source or interaction mediator. Dr. Doyong Kwon studies quantum cellular automata and multiple qubit entanglements.

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### **Computational Mathematics:**

This group put its focus on various mathematical issues arising from modern information science. It utilizes methods of algebraic and symbolic computation together with traditional numerical computation. This is mainly due to the digital nature inherent in many problems in information science. The specific research areas it is currently working on include the following:

1. Algebraic and Symbolic Computation: Applications to digital signal processing and system theory, Cryptography
2. Computer-aided-geometric-design (CAGD) and geometric computation
3. Financial Mathematics
4. Mathematical Biology

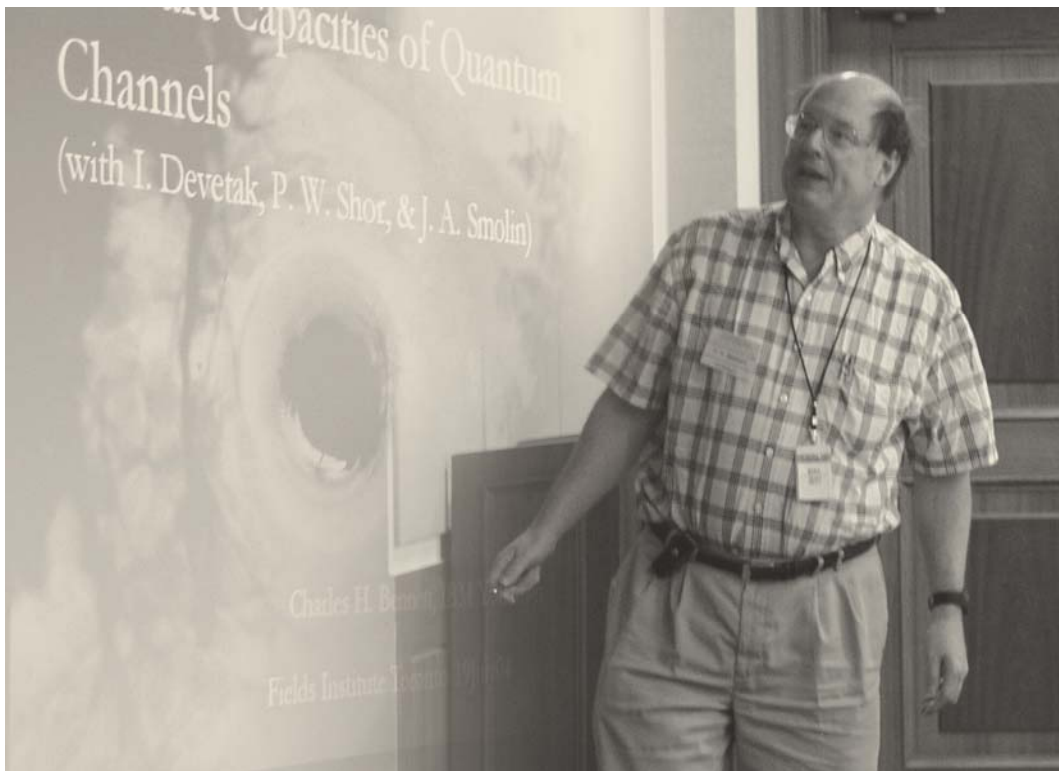
Professor Hyungju Park taught a one-semester course on computer algebra at KAIST, Daejeon in the fall of 2004. His new research on algebraic cryptography was funded by National Security Research Institute, a research wing of ETRI. He also gave a special lecture series on computational algebraic geometry at Sogang University in October and November of 2004.

Dr. Eunjeong Lee studied Tate pairing on hyperelliptic curves for secure and efficient cryptosystem.

Dr. Kyoung Jin Choi studied on the retirement behaviour of the economic agent who is an investor to the asset market as well as a wage earner and the effect when there are new arrival of assets or death of assets under the timing uncertainty.

Dr. Sung Woo Choi studied geometric and computational analysis on geometric entities in computer-aided geometric design such as curve, surface, medial axis, offset and recent research topics are approximation theory covering wavelet, subdivision, radial function, moving least square and exact computability of non-algebraic problems in computational geometry.

Dr. Eunhee Koh's study includes differential geometry and bending energy in macromolecules and rough singular integral operators.



Prof. Charles Bennett (IBM) presents a lecture on "Back Communication and Forward Capacity of Quantum Channels" at KIAS-KAIST Workshop on Quantum Information Science, August 29-31, 2004



Prof. Kunihiro Kuwajima (University of Tokyo) delivers a lecture on “Protein Folding” at the 3rd KIAS Protein Folding Summer School, August 9-14, 2004

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### Visiting Scientists

Kim, Young J. July 21, 2003 – March 2004 Bioscience & Protein Folding Johns Hopkins University	Yoon, Jungho February 14, 2004 – March 1, 2004 Subdivision/Image Processing/Radial Basis Function Ewha Womans University
Nam, Baek Il November 10, 2003 – April 9, 2004 Quantum Information Myungji University	van der Marel, Dirk February 21, 2004 – February 22, 2004 Solid State Material Property University of Geneva
Song, Ju-Beom December 6, 2003 – February 28, 2004 Protein Structure Prediction by Threading Studies Kyungpook National University	Marsiglio, Frank February 21, 2004 – February 3, 2004 Solid State Material Property Universtiy of Alberta
Lee, Julian December 27, 2003 – February 29, 2004 Ads, CFT Correspondence Soongsil University	Tamegai, T. February 21, 2004 – February 23, 2004 Solid State Material Property University of Tokyo
Lee, Sang Bub January 2, 2004 – February 29, 2004 Random Walk & Polypeptides Kyungpook National University	Song, Ju-Beom March 5, 2004 – March 15, 2004 Protein Structure Prediction by Threading Studies Kyungpook National University
Kim, Young Soon January 2, 2004 – July 31, 2004 Computational Sciences Myungji University	Lee, Sang Bub March 18, 2004 – March 20, 2004 Protein Folding Kyungpook National University
Kim, Hyung-Rae January 13, 2004 – March 31, 2004 Protein Structure Prediction by Threading and Cellular Automata Electronics and Telecommunications Research Institute	Enkhbat, Rentsen March 22, 2004 – April 15, 2004 Protein Structure Study by Global Optimization National University of Mongolia



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Lee, Sang Bub  
April 1, 2004 – April 3, 2004  
Protein Folding  
Kyungpook National University

Kim, T. H.  
April 9, 2004 – April 10, 2004  
RNA Database Programming Consulting  
POSCO Technology Research Laboratory

Sohn, Y. W.  
April 15, 2004 – April 18, 2004  
Solid State Material Property  
Center for Theoretical Physics,  
Seoul National University

Gao, Xiaoshan  
April 21, 2004 – April 27, 2004  
Symbolic and Algebraic Computation  
International Security Systems

Jeong, Hyunseok  
May 10, 2004 – May 24, 2004  
Quantum Optics and Quantum Information  
Theory  
University of Queensland

Lee, In-Ho  
May 17, 2004 – May 19, 2004  
Protein Folding  
Korea Research Institute of Standards and  
Science

Park, J. M.  
May 28, 2004 – May 30, 2004  
Electronic Structure Calculation  
Indian Institute of Technology

Kim, Young J.  
June 1, 2004 – October 31, 2004  
Bio-Statistics  
Johns Hopkins University

Yoon, Jungho  
June 11, 2004 – June 12, 2004  
Numerical Analysis  
Ewha Womans University

Kim, Y. G.  
June 11, 2004 – June 12, 2004  
Computational Algebraic Geometry  
Chonnam National University

Quan, Yuwan  
June 17, 2004 – June 19, 2004  
Nano CSMO Modeling  
Fudan University

Lee, Sang Bub  
June 18, 2004 – June 19, 2004  
Protein Folding  
Kyungpook National University

Masayasu, Miyata  
June 24, 2004 – June 26, 2004  
Current Leakage Phenomena in Si-SiO<sub>2</sub> Devices  
Seiko-Epson Corporation

Song, Ju-Beom  
July 1, 2004 – August 25, 2004  
Protein Structure Prediction by Threading Studies  
Kyungpook National University

Noh, T. G.  
July 8, 2004 – July 16, 2004  
Implementation of Quantum Cryptography  
Technology  
Electronics and Telecommunications  
Research Institute

Hong, Jongcheol  
July 8, 2004 – July 16, 2004  
Implementation of Quantum Cryptography  
Technology  
Electronics and Telecommunications Research  
Institute

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Chandrasekhar, Venkat  
July 11, 2004 – July 13, 2004  
Electrical Transport in Nanostructures  
Northwestern University

Kim, Kisik  
July 12, 2004 – July 16, 2004  
Quantum Information Science  
Inha University

Lee, In-Ho  
July 20, 2004 – July 22, 2004  
Protein Folding  
Korea Research Institute of Standards and  
Science

Kim, T.H.  
August 6, 2004 – August 8, 2004  
Simulation Programming  
Research Institute of Gwangyang, POSCO

Mujica, Vladimiro  
August 26, 2004 – September 9, 2004  
Molecular Conductance  
University Central de Venezuela

Cho, E.S.  
August 31, 2004 – September 30, 2004  
4th KIAS Conference on Protein Structure  
and Function  
Columbia University

Park, Sungho  
September 20, 2004 – December 20, 2004  
Differential Geometrical Study of  
Biomolecular Structures  
Seoul National University

Wang, Xiang -Bin  
October 11, 2004 – October 21, 2004  
Quantum Information  
Japan Science and Technology Agency

Masayasu, Miyata  
October 13, 2004 – October 16, 2004  
Current Leakage Phenomena in Si-SiO<sub>2</sub>  
Devices  
Seiko-Epson Corporation

Buchberger, Bruno  
October 29, 2004 – October 30, 2004  
Computational Algebra  
Johannes Kepler University

Duc, Truong Minh  
December 10, 2004 – January 9, 2005  
Nonclassical States related to Quantum  
Information  
Hue Pedagogy University

Hong, Sangjin  
December 23, 2004 – January 5, 2005  
Digital Signal Processing  
State University of New York

## SCHOOL OF COMPUTATIONAL SCIENCES

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### Research Activities (Workshops, Symposia, Conferences, Seminars, etc.)

#### Workshops/Symposia/Conferences

The 2nd Winter School on Computational Methods (February 5, 2004 ~ February 6, 2004)  
KIAS Special Lecture on Strongly Correlated Electron System (February 21, 2004 ~ February 23, 2004)  
KIAS Special Lectures on Quantum Information Science by Dr. Charles Bennett  
(April 27, 2004 ~ April 28, 2004)  
KIAS Special Lecture by Prof. Kosterlitz (June 22, 2004, June 25, 2004)  
KIAS Workshop on Quantum Information Science (May 17, 2004 ~ May 18, 2004)  
The 3rd Protein Folding Summer School (August 9, 2004 ~ August 13, 2004)  
KIAS Nobel Lecture by Prof. Sir Harold W. Kroto (August 26, 2004)  
KIAS-KAIST Workshop on Quantum Information Science (August 29, 2004 ~ August 31, 2004)  
KIAS Workshop on Electronic Structure Calculations (September 13, 2004 ~ September 14, 2004)  
The 4th KIAS Conference on Protein Structure and Function  
(September 20, 2004 ~ September 22, 2004)

#### Seminars

January 3, 2004 Choi, Sung Woo (Korea Institute for Advanced Study) Subdivision Seminar	January 12, 2004 Kim, Hyung Joon (Carnegie Mellon University) Computer Simulations of Liquid Water
January 5, 2004 Quantum Information Group (Korea Institute for Advanced Study) Properties of Quantum Languages	January 12, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
January 5, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	January 13, 2004 Quantum Information Group (Korea Institute for Advanced Study) Preskill's Lecture Note
January 6, 2004 Quantum Information Group (Korea Institute for Advanced Study) Preskill's Lecture Note	January 15, 2004 Choi, Sung Woo (Korea Institute for Advanced Study) Subdivision Seminar
January 12, 2004 Quantum Information Group (Korea Institute for Advanced Study) Quantum Information Journal Club	January 16, 2004 Hwang, Chi-Ok (Computational Electronics Center, Inha University) Kinetic Monte Carlo Simulations for Dopant Diffusion in Ion-Implanted Crystalline Materials

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January 17, 2004  
Choi, Sung Woo  
(Korea Institute for Advanced Study)  
Subdivision Seminar

January 20, 2004  
Protein Folding Group  
(Korea Institute for Advanced Study)  
Protein Folding Group Meeting

January 26, 2004  
Protein Folding Group  
(Korea Institute for Advanced Study)  
Protein Folding Group Meeting

January 26, 2004  
Quantum Information Group  
(Korea Institute for Advanced Study)  
Electron G Factor Engineering in III-IV  
Semiconductors For Quantum  
Communications

January 27, 2004  
Quantum Information Group  
(Korea Institute for Advanced Study)  
Preskill's Lecture Note

January 28, 2004  
Choi, Sung Woo  
(Korea Institute for Advanced Study)  
Subdivision Seminar

January 29, 2004  
Lee, Eunjung (Pohang University of Science  
and Technology)  
Tate Pairing on Hyperelliptic Curves and Its  
Applications

January 31, 2004  
Choi, Sung Woo  
(Korea Institute for Advanced Study)  
Subdivision Seminar

February 2, 2004  
Quantum Information Group  
(Korea Institute for Advanced Study)  
On the Power of Quantum Finite State  
Automata

February 2, 2004  
Protein Folding Group  
(Korea Institute for Advanced Study)  
Protein Folding Group Meeting

February 3, 2004  
Quantum Information Group  
(Korea Institute for Advanced Study)  
Jozef Gruska "Quantum Computing"

February 7, 2004  
Choi, Sung Woo  
(Korea Institute for Advanced Study)  
Subdivision Seminar

February 9, 2004  
Quantum Information Group  
(Korea Institute for Advanced Study)  
Optical Galton Board

February 9, 2004  
Protein Folding Group  
(Korea Institute for Advanced Study)  
Protein Folding Group Meeting

February 10, 2004  
Quantum Information Group  
(Korea Institute for Advanced Study)  
Jozef Gruska "Quantum Computing"

February 12, 2004  
Choi, Kyoung Jin (Korea Advanced Institute  
of Science and Technology)  
Mathematical Decision Problems in Finance and  
Economics: An Overview and Further Research

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February 16, 2004 Quantum Information Group (Korea Institute for Advanced Study) A Brief Review on the Theory of Quantum Error Correcting Codes	March 2, 2004 Aihara, Masaki (NARA Institute of Science and Technology) Photogenerated Macroscopic Quantum States
February 17, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska "Quantum Computing"	March 2, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
February 23, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	March 2, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska "Quantum Computing"
February 23, 2004 Quantum Information group (Korea Institute for Advanced Study) Optical Galton Board	March 8, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
February 24, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska "Quantum Computing"	March 8, 2004 Oh, Sangchul (Korea Institute for Advanced Study) Entanglement of Cooper Pairs in Superconductors
February 24, 2004 Yoon, Jungho (Ewha Womans University) Multivariate Local Edge Detection	March 9, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska "Quantum Computing"
February 25, 2004 Song, Ju-Beom (Kyungpook National University) Knowledge-Based Potential by Zhou and It's Applications	March 11, 2004 Sim, Eunji (Yonsei University) Quantum Dynamics for a System coupled to Slow Baths
February 26, 2004 Cho, Kwang-Hwi (Soongsil University) A Simplified Potential Energy Function for Ab Initio Protein Folding	March 15, 2004 Lee, Seungwoo (Hanyang University) Introduction to Decoherence
February 27, 2004 Kim, Seung-Yeon (Korea Institute for Advanced Study) Overview on TINKER	March 15, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting

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March 16, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska “Quantum Computing”	March 29, 2004 Song, MeeKyung (Korea Institute for Advanced Study) Research Talk
March 17, 2004 Choi, Sung Woo (Korea Institute for Advanced Study) Subdivision Seminar	March 29, 2004 Joo, Jaewoo (Korea Institute for Advanced Study) Mutual Information in an Individual Attack
March 17, 2004 Nano Group (Korea Institute for Advanced Study) Nano CMOS	March 30, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska “Quantum Computing”
March 18, 2004 Lee, Kyu Hwan (Supercomputational Materials Simulation Team in Korea Institute of Science and Technology/Linux Grand Cluster Supercomputer in Korea Institute of Science and Technology) Design and Performance Tuning	April 1, 2004 Enkhbat, R. (National University of Mongolia) Recent Advances in Global Optimization
March 22, 2004 Tame, Mark (Korea Institute for Advanced Study) Implementing Quantum Algorithms Using Quantum Logic Gates Made from Optical Components	April 2, 2004 Yap, Chee (Courant Institute, New York University) Exact Geometric Computation: Overview
March 23, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska “Quantum Computing”	April 6, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
March 25, 2004 Jin, sunsuk (Kyung Hee University) Minimal Surfaces in $\mathbb{R}^3$	April 6, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska “Quantum Computing”
March 25, 2004 Yang, Yeon Hyeong (Pohang University of Science and Technology) Efficient Methods to Construct Pairing-Based Cryptosystems	April 6, 2004 Hong, Sangjin (State University of New York, Stony Brook) Digital Signal Processing Systems and Low- Power VLSI Design
	April 7, 2004 Lee, K (Korea Institute for Advanced Study) Homology CASP6 Meeting

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April 8, 2004 Enkhbat, R. (National University of Mongolia) Analysis of Response Surface Problems Using Quadratic Programming	April 26, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
April 12, 2004 Lee, Soojoon (Korea Institute for Advanced Study) Standard Teleportation, Fidelity, and Entanglement	April 26, 2004 Quantum Information Group (Korea Institute for Advanced Study) Entanglement-Assisted Capacity of a Quantum Channel and the Reverse Shannon Theorem
April 12, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	April 27, 2004 Bennett, Charles H. (IBM Watson Laboratory) Introduction to Quantum Information and Computation
April 13, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska “Quantum Computing”	April 27, 2004 Gao, Xiao-Shan (Chinese Academy of Sciences) Conversion Between Implicit and Parametric Representation of Differential Varieties
April 14, 2004 Choi, Sung Woo (Korea Institute for Advanced Study) Subdivision Seminar	April 27, 2004 Yap, Chee (Courant Institute, New York University) Complete Subdivision Algorithm for Intersecting Bezier Curves
April 16, 2004 Park, Tae-Joon (Seoul National University) Radix Representations and the Elliptic Curve Cryptosystems	April 27, 2004 Shim, Gyocheol (Korea Advanced Institute of Science and Technology) Pay for Performance Under Hierarchical Contracting
April 19, 2004 Quantum Information Group (Korea Institute for Advanced Study) Universal Quantum Data Compression via Gentle Tomography	April 28, 2004 Bennett, Charles H. (IBM Watson Laboratory) Quantum Communication: Resources and Tradeoffs
April 20, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	April 29, 2004 Cho, Jun-Hyung (Hanyang University) Adsorption and Reaction of Organic Molecules on Semiconductor Surfaces
April 20, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska “Quantum Computing”	

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April 30, 2004

Kim, Jaewan  
(Korea Institute for Advanced Study)  
Korea Young Scientists Tournament  
Preparation Meeting

May 1, 2004

Kim, Jaewan  
(Korea Institute for Advanced Study)  
Korea Young Scientists Tournament  
Preparation Meeting – 2nd day

May 3, 2004

Protein Folding Group  
(Korea Institute for Advanced Study)  
Protein Folding Group Meeting

May 3, 2004

Quantum Information Group  
(Korea Institute for Advanced Study)  
Conditional Generation of Quantum  
Entanglement of Many Distant Atoms via  
Multifold Coincidence Detection

May 4, 2004

Quantum Information Group  
(Korea Institute for Advanced Study)  
Jozef Gruska “Quantum Computing”

May 7, 2004

Park, Hyungju  
(Korea Institute for Advanced Study)  
Grobner Basis: a Crash Course I, II

May 14, 2004

Yap, Chee  
(Courant Institute, New York University)  
Theory of Real Approximation

May 14, 2004

Protein Folding Group  
(Korea Institute for Advanced Study)  
Protein Folding Group Meeting

May 17, 2004

Protein Folding Group  
(Korea Institute for Advanced Study)  
Protein Folding Group Meeting

May 17, 2004

Quantum Information Science Group  
(Korea Research Foundation)  
Quantum Information Science Workshop

May 18, 2004

Jeong, Hyunseok (University of Queensland)  
Production of Optical Schrodinger Cat States  
and Quantum Information Processing

May 18, 2004

Quantum Information Group  
(Korea Institute for Advanced Study)  
Jozef Gruska “Quantum Computing”

May 21, 2004

Park, Hyungju (Korea Institute for Advanced Study)  
Algebraic Cryptography Seminar

May 24, 2004

Protein Folding Group  
(Korea Institute for Advanced Study)  
Protein Folding Group Meeting

May 24, 2004

Lee, Soojoon (Korea Institute for Advanced Study)  
Quantum Entanglement and Topological  
Entanglement

May 25, 2004

Quantum Information Group  
(Korea Institute for Advanced Study)  
Jozef Gruska “Quantum Computing”

May 31, 2004

Protein Folding Group  
(Korea Institute for Advanced Study)  
Protein Folding Group Meeting



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May 31, 2004 Oh, Sangchul (Korea Institute for Advanced Study) Entanglement of Electron Spins in Quantum Dots via the RKKY Interaction	June 11, 2004 Choi, Sung Woo (Korea Institute for Advanced Study) Korea Mathematical Methods for Curves and Surfaces
June 1, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska “Quantum Computing”	June 11, 2004 Park, Hyungju (Korea Institute for Advanced Study) A Crash Course in Grobner Basis III: Elimination Theory
June 4, 2004 Choi, Sung Woo (Korea Institute for Advanced Study) Subdivision Seminar	June 12, 2004 Choi, Sung Woo (Korea Institute for Advanced Study) Korea Mathematical Methods for Curves and Surfaces
June 7, 2004 Kwon, DoYong (Korea Institute for Advanced Study) Finite Automata with Special Regards to Applications	June 14, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
June 8, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	June 14, 2004 Podoshvedov, Sergey (Korea Institute for Advanced Study) Mode Entanglement for Quantum Teleportation and Control Sign Gate
June 8, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska “Quantum Computing”	June 14, 2004 Lee, Seungwoo (Hanyang University) Quantum Nonlocality: Introduction and Bell Inequality for Arbitrary High-Dimensional Systems
June 11, 2004 Nano Group (Korea Institute for Advanced Study) Image Sensor	June 15, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska “Quantum Computing”
June 11, 2004 Park, Hyungju (Korea Institute for Advanced Study) A Crash Course in Grobner Basis IV: Invariant Theory	June 18, 2004 Park, Hyungju (Korea Institute for Advanced Study) Faugere’s F5 Algorithm: a New Efficient Way of Computing Grobner Bases

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June 21, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	June 25, 2004 Kim, Jeongtae (Ewha Womans University) Particle Filtering, Part I: An Emerging Methodology for Sequential Signal Processing
June 21, 2004 Lee, Soojoon (Korea Institute for Advanced Study) Three-Qubit State and Three-Party Teleportation	June 28, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
June 22, 2004 Kosterlitz, Mike (Brown University) Lectures on RG and XY-Model (1&2)	June 28, 2004 Tame, Mark (Korea Institute for Advanced Study) The Discrete Unitary Operator $U(N)$ can be Realized Using Linear Optics
June 22, 2004 Kim, Kyung-Sik (Pukyong National University) Dynamical Behaviors of Econophysics	June 28, 2004 Cha, Seunghyun (Hanyang University) Littrow Configuration Tunable External Cavity Diode Laser with Fixed Direction Output Beam
June 22, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska "Quantum Computing"	June 29, 2004 Quantum Information Group (Korea Institute for Advanced Study) Jozef Gruska "Quantum Computing"
June 22, 2004 Georgeot, Bertrand (Universite Paul Sabatier) Chaos and Quantum Computation	July 2, 2004 Kim, Jeongtae (Ewha Womans University) Particle Filtering, Part II: An Emerging Methodology for Sequential Signal Processing
June 22, 2004 Jung, Youngkyun (Korea Institute of Science and Technology Information) Molecular Dynamics Simulations of Granular Materials	July 5, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
June 24, 2004 Lee, Jeong-O (Korea Research Institute of Chemical Technology) An Enzyme Activity Sensor Based on a Single Carbon	July 5, 2004 Cha, Seunghyun (Hanyang University) Littrow Configuration Tunable External Cavity Diode Laser with Fixed Direction Output Beam
June 25, 2004 Kosterlitz, Mike (Brown University) Lectures on RG and XY-Model (3&4)	

## SCHOOL OF COMPUTATIONAL SCIENCES

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July 5, 2004 Kim, Yu Jin (Myongji University) Generation of W State Using Parametric Down-Conversion	August 5, 2004 Cha, Jae Choon (International Components for Unicode) Randomized Computation and Provable Security, Part I
July 12, 2004 Chandrasekhar, Venkat (Northwestern University) Impurity Mediated Conduction of Multi-Wall Carbon Nanotubes	August 6, 2004 Cha, Jae Choon (International Components for Unicode) Randomized Computation and Provable Security, Part II
July 12, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	August 9, 2004 Kim, Youngchul (Sunmoon University) Nonclassicality and Entanglement of Quantum Light
July 12, 2004 Lee, Soojoon (Korea Institute for Advanced Study) Three-Qubit Pure State and Three-Party Teleportation	August 13, 2004 Cho, Hyun-Soo (Yonsei University) Structure of the Extracellular Region of HER2 Both Alone and Complexed with the Herceptin Fab
July 19, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	August 13, 2004 Soh, Mun Soo (Sejong University) Toward Understanding Molecular Mechanisms of Light-Dependent Development in Arabidopsis Thaliana
July 19, 2004 Oh, Sangchul (Korea Institute for Advanced Study) Indirect Interaction between Qubits Induced by a Common Environment	August 13, 2004 Kim, Daesoo (Korea Advanced Institute of Science and Technology) The Role of T-Type Ca <sup>2+</sup> Channels in the Thalamic Sensory Gating, Novelty-Seeking, and Alcohol Preference
July 22, 2004 Yokoyama, Kazuhiro (Kyushu University) Primary Decomposition of Polynomial Ideals	August 13, 2004 Koh, Eunhee (Korea Institute for Advanced Study) Differential Geometry in Beta-Sheet Formation in Protein
July 26, 2004 Lee, Seungwoo (Hanyang University) Optimal Quantum Teleportation Protocols	August 13, 2004 Park, June Young (Isu Chemical CO. LTD) Beta-Sheet Forming Mechanism in Alzheimer and Parkinson Disease
July 28, 2004 Choi, Sung Woo (Korea Institute for Advanced Study) Subdivision Seminar	

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August 16, 2004 Kim, Myungshik (Queens University) Transfer of Entanglement	August 28, 2004 Mujica, Vladimiro (Central University of Venezuela) Molecular Conduction I
August 16, 2004 Kwon, DoYong (Korea Institute for Advanced Study) The Quantum Entanglement of Binary and Bipolar Sequences; Linear Entanglement	September 1, 2004 Mujica, Vladimiro (Central University of Venezuela) Molecular Conduction II
August 16, 2004 Choi, Yunjin (Sogang University) On the Conclusive Teleportation	September 1, 2004 Oh, Dong Yeol (Pohang University of Science and Technology) On the Poset Codes and Superimposed Codes
August 19, 2004 Park, Hyungju (Korea Institute for Advanced Study) Algebraic Cryptography Seminar	September 2, 2004 Mujica, Vladimiro (Central University of Venezuela) Molecular Conduction III
August 23, 2004 Podoshvedov, Sergey (Korea Institute for Advanced Study) Mode Entangled States for Quantum Teleportation, Construction of Controlled Gates and Quantum Lithography	September 3, 2004 Mujica, Vladimiro (Central University of Venezuela) Molecular Conduction IV
August 25, 2004 Lee, Eunjeong (Korea Institute for Advanced Study) Cryptography Seminar	September 13, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
August 26, 2004 Mujica, Vladimiro (Central University of Venezuela) Rectification Effects in Molecular Electronics	September 13, 2004 Kim, Jaewan (Korea Institute for Advanced Study) Quantum Teleportation Using Linear Optics
August 26, 2004 Jang, Bong-Gyu (Korea Advanced Institute of Science and Technology) Financial Optimazation with Transaction Costs	September 16, 2004 Lee, Y. J. (Ewha Womans University) Construction of A New Class of Compactly Supported Symmetric Biorthogonal Wavelets
August 27, 2004 Lee, Eunjeong (Korea Institute for Advanced Study) Algebraic Cryptography Seminar	September 16, 2004 Cho, Eun-Sung Art (Columbia University) The Importance of Accurate Charges in Molecular Docking: Quantum Mechanical,

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September 20, 2004 Lee, Eunjeong (Korea Institute for Advanced Study) CM Group Meeting: Security	October 12, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
September 20, 2004 Kwon, DoYong (Korea Institute for Advanced Study) Quantum Languages Form a Basis for Hall Topology of Free Monoids	October 14, 2004 Wang, Xiang-bin (Exploratory Research for Advanced Technology/Japan Science and Technology Agency) Fault Tolerant Quantum Key Distribution Protocol with Collective Random Unitary Noise
September 23, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	October 18, 2004 Kim, Yu Jin (Myongji University) Valence Bond Solid for Quantum Computation
September 24, 2004 Itoh, Kohei M. (Keio University) Silicon Quantum Computers	October 18, 2004 Noh, Jaewoo (Inha University) Analysis of Quantum Lithography Using Entangled Photons
September 24, 2004 Brooks, Bernard (National Institute of Health) Charmm Force Field and its Application to Macromolecular Systems	October 18, 2004 Wang, Xiang-bin (Exploratory Research for Advanced Technology/Japan Science and Technology Agency) Entanglement Concentration by Ordinary Linear Optical Devices without Post-Selection
October 4, 2004 Lee, Jinyoung (Hanyang University) Greenberger-Horne-Zeilinger Paradox in Tripartite Systems of Arbitrary Dimension	October 19, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
October 7, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	October 25, 2004 Oh, Sangchul (Korea Institute for Advanced Study) Entanglement between a Qubit and the Environment in the Spin-Boson Model
October 11, 2004 Kim, Yu Jin (Myongji University) Valence Bond Solid for Quantum Computation	October 26, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
October 11, 2004 Podoshvedov, Sergey (Korea Institute for Advanced Study) Conditional Sign Flip via Teleportation	

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October 28, 2004 Buchberger, Bruno (Johannes Kepler University) Computer Algebra: A Key to the Future of Mathematics, Science, and Engineering	November 15, 2004 Kim, Jaewan (Korea Institute for Advanced Study) Quantum Imaging
November 1, 2004 Kim, H. J. (Inha University) Quantum Lithography	November 16, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
November 2, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	November 22, 2004 Kwon, DoYong (Korea Institute for Advanced Study) Quantum Information Science Journal Club
November 4, 2004 Oh, Seongshik (National Institute of Standards and Tehnology) Josephson Junction Phase Quantum Bit	November 22, 2004 Kwon, DoYong (Korea Institute for Advanced Study) On Generalized Schmidt Decomposition
November 8, 2004 Kwon, DoYong (Korea Institute for Advanced Study) Quantum Information Science Journal Club	November 23, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
November 8, 2004 Lee, Seung Woo (Hanyang University) Optimal Protocols of Quantum Teleportation with Operational Distance	November 23, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group: In-House Conference
November 9, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	November 23, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group: In-House Conference
November 11, 2004 Lee, M. B. (Ewha Womans University) Non-Uniform Weighted Average Sampling and Reconstruction in Shift-Invariant and Wavelet Spaces	November 24, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
November 15, 2004 Kwon, DoYong (Korea Institute for Advanced Study) Quantum Information Science Journal Club	November 26, 2004 Joo, Kihyung (Korea Institute for Advanced Study) SAC CASP Presentation

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November 29, 2004 Kwon, DoYong (Korea Institute for Advanced Study) Quantum Information Science Journal Club	December 13, 2004 Oh, Sangchul (Korea Institute for Advanced Study) Entanglement of Aimpurity Sin and a Conduction Electron in Kondo Model
November 29, 2004 Cha, Seunghyun (Hanyang University) Homodyne Detection	December 14, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
November 30, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	December 20, 2004 Quantum Information Science Journal Club (Korea Institute for Advanced Study) Quantum Computing with Cluster States
December 6, 2004 Quantum Information Science Journal Club (Korea Institute for Advanced Study) Quantum Computing with Cluster States	December 20, 2004 Podoshvedov, Sergey (Korea Institute for Advanced Study) Total Teleportation of Multi-Particle/ Entangled State
December 6, 2004 Nguyen, Ba An (Korea Institute for Advanced Study) Cavity QED Tools for Quantum Information Processing	December 21, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
December 7, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting	December 22, 2004 Hong, Sangjin (State University of New York, Stony Brook) Paticle Filter Architecture for Tracking Applications
December 10, 2004 Choi, Sung Woo (Korea Institute for Advanced Study) Subdivision Seminar	December 27, 2004 Quantum Information Science Journal Club (Korea Institute for Advanced Study) Quantum Computing with Cluster States
December 13, 2004 Kwon, DoYong (Korea Institute for Advanced Study) Quantum Information Science Journal Club	December 28, 2004 Protein Folding Group (Korea Institute for Advanced Study) Protein Folding Group Meeting
December 13, 2004 Cha, Seunghyun (Hanyang University) Homodyne Detection	

**Publications**

An NB

Optimal processing of quantum information via W-type entangled coherent states  
PHYSICAL REVIEW A 69 (2): Art. No. 022315 FEB 2004

Baek CK, Song YH, Kim B, Quan WY, Park YJ, Min HS, Kim DM

High speed, low power programming in 0.17  $\mu$  m channel length NOR-type floating gate flash memory cell free of drain turn-on effects  
JAPANESE JOURNAL OF APPLIED PHYSICS PART 2-LETTERS 43 (2A): L224-L226  
FEB 1 2004

Brouet V, Yang WL, Zhou XJ, Choi HJ, Louie SG, Cohen ML, Goldoni A, Parmigiani F, Hussain Z, Shen ZX

Orientation-dependent C-60 electronic structures revealed by photoemission spectroscopy  
PHYSICAL REVIEW LETTERS 93 (19): Art. No. 197601 NOV 5 2004

Chi DP, Kwon D

Stunniar words, beta-shifts, and transcendence  
THEORETICAL COMPUTER SCIENCE 321 (2-3): 395-404 AUG 16 2004

Cho Y, Koh E, Lee S

A maximal inequality for filtration on some function spaces  
OSAKA JOURNAL OF MATHEMATICS 41 (2): 267-276 JUN 2004

Gao JL, Byun KL, Kluger R

Catalysis by enzyme conformational change  
TOPICS IN CURRENT CHEMISTRY 238: 113-136 2004

Ishigami M, Choi HJ, Aloni S, Louie SG, Cohen ML, Zettl A

Identifying defects in nanoscale materials  
PHYSICAL REVIEW LETTERS 93 (19): Art. No. 196803 NOV 5 2004

Joo K, Kim I, Kim SY, et al.

Prediction of the secondary structures of proteins by using PREDICT, a nearest neighbor method on pattern space  
JOURNAL OF THE KOREAN PHYSICAL SOCIETY 45 (6): 1441-1449 DEC 2004

Joo K, Lee J, Kim SY, Kim I, Lee J, Lee SJ

Profile-based nearest neighbor method for pattern recognition  
JOURNAL OF THE KOREAN PHYSICAL SOCIETY 44 (3): 599-604 Part 1 MAR 2004



Kim S

Protein beta-turn prediction using nearest-neighbor method  
BIOINFORMATICS 20 (1): 40-44 JAN 1 2004

Kim SY

Yang-Lee zeros of the one-dimensional Q-state Potts model  
JOURNAL OF THE KOREAN PHYSICAL SOCIETY 44 (3): 495-500 Part 1 MAR 2004

Kim SY

Fisher zeros and Potts zeros of the Q-state Potts model in a magnetic field  
JOURNAL OF THE KOREAN PHYSICAL SOCIETY 45 (2): 302-309 AUG 2004

Kim SY

Density of the Fisher zeros for the three-state and four-state Potts models  
PHYSICAL REVIEW E 70 (1): Art. No. 016110 Part 2 JUL 2004

Kim SY

Yang-Lee zeros of the antiferromagnetic Ising model  
PHYSICAL REVIEW LETTERS 93 (13): Art. No. 130604 SEP 24 2004

Kim SY, Lee J, Lee SJ

The energy landscape of a BLN protein with beta-hairpin shape  
JOURNAL OF THE KOREAN PHYSICAL SOCIETY 44 (3): 589-593 Part 1 MAR 2004

Kwon S, Park H

Stability of vacuum in coupled directed percolation processes  
PHYSICAL REVIEW E 69 (6): Art. No. 066125 Part 2 JUN 2004

Lee HM, Tarakeshwar P, Park J, Kolaski MR, Yoon YJ, Yi HB, Kim WY, Kim KS

Insights into the structures, energetics, and vibrations of monovalent cation-(Water)<sub>(1-6)</sub> clusters  
JOURNAL OF PHYSICAL CHEMISTRY A 108 (15): 2949-2958 APR 15 2004

Lee IH, Lee J

Accurate transition pathway calculation for rare events  
JOURNAL OF THE KOREAN PHYSICAL SOCIETY 44 (3): 605-610 Part 1 MAR 2004

Lee IH, Kim H, Lee J

Dynamic pathway model for the formation of C-60  
JOURNAL OF CHEMICAL PHYSICS 120 (10): 4672-4676 MAR 8 2004

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Lee J, Kim SY, Joo K, Kim I, Lee J

Prediction of protein tertiary structure using PROFESY, a novel method based on fragment assembly and conformational space annealing

PROTEINS-STRUCTURE FUNCTION AND BIOINFORMATICS 56 (4): 704-714 SEP 1 2004

Lee J, Kim SY, Lee J

Design of a protein potential energy landscape by parameter optimization

JOURNAL OF PHYSICAL CHEMISTRY B 108 (14): 4525-4534 APR 8 2004

Lee J, Kim SY, Lee J

Optimization of potential-energy parameters for folding of several proteins

JOURNAL OF THE KOREAN PHYSICAL SOCIETY 44 (3): 594-598 Part 1 MAR 2004

Lee J, Lee S, Kim J, Oh SD

Entanglement swapping secures multipartite quantum communication

PHYSICAL REVIEW A 70 (3): Art. No. 032305 SEP 2004

Lee S, Chi DP, Oh SD, Kim J

Convex-roof extended negativity as an entanglement measure for bipartite quantum systems

PHYSICAL REVIEW A 68 (6): Art. No. 062304 DEC 2003

Lee S, Choi S, Chi DP

Faithful sharing of multipartite entanglement over noisy quantum channels

JOURNAL OF THE KOREAN PHYSICAL SOCIETY 45 (4): 1119-1122 OCT 2004

Nguyen BA

Quantum dialogue

PHYSICS LETTERS A 328 (1): 6-10 JUL 19 2004

Oh S, Kim J

Entanglement of electron spins of noninteracting electron gases

PHYSICAL REVIEW A 69 (5): Art. No. 054305 MAY 2004

Park HK, Bar M

Spiral destabilization by resonant forcing

EUROPHYSICS LETTERS 65 (6): 837-843 MAR 2004

Sim J, Kim SY, Lee J, Yoo A

Predicting the three-dimensional structures of proteins: Combined alignment approach

JOURNAL OF THE KOREAN PHYSICAL SOCIETY 44 (3): 611-616 Part 1 MAR 2004

## SCHOOL OF COMPUTATIONAL SCIENCES

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Song MK, No KT

Substitution effect of carbon with group 13, 14, and 15 elements on lithium intercalation in graphite

JOURNAL OF THE ELECTROCHEMICAL SOCIETY 151 (10): A1696-A1701 2004

Truong MD, Nguyen BA

Hillery-type squeezing in fan states

JOURNAL OF THE KOREAN PHYSICAL SOCIETY 44 (6): 1421-1426 JUN 2004

Yi HS, Nguyen BA, Kim J

K-dimensional trio coherent states

JOURNAL OF PHYSICS A-MATHEMATICAL AND GENERAL 37 (45): 11017-11036  
NOV 12 2004

Yu H

On Tate-Shafarevich groups over Galois extensions

ISRAEL JOURNAL OF MATHEMATICS 141: 211-220 2004

Yu H

Representations and factors of restriction of scalars

JOURNAL OF NUMBER THEORY 109 (2): 266-277 DEC 2004

## NOBEL LAUREATE LECTURE

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Prof. Harold W. Kroto, Nobel Laureate of Chemistry 1996 addresses a lecture titled "2010, a NanoSpace Odyssey" at KIAS Nobel Lecture on August 26, 2004

## ELITE CLUB MEMBERSHIP

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The image shows a presentation slide titled "Elite Club Membership". It features a table with two columns of names and their corresponding scores. The table is presented in a light gray, rounded rectangular frame with a metallic texture. The table has a header row with "Name" in each of the two columns. The data rows are as follows:

	Name		Name
<b>100</b>	Baker	<b>101</b>	Baker-Robetta
<b>021</b>	Kolinski&Bujnicki	<b>604</b>	Baker-Robetta_04
<b>450</b>	Ginalski	<b>051</b>	Rokko
<b>166</b>	SAM-T04-hand (Karplus)	<b>052</b>	Rokky
<b>176</b>	Skolnick-Zhang	<b>089</b>	KIAS
<b>003</b>	Jones-UCL	<b>501</b>	MCon

KIAS ranked in the 8th place in the category of New Fold at the 6th Critical Assessment of Techniques for Protein Folding Structure which was held in Genova, Italy, December 4-8, 2004

## ALUMNI

---

### *Alumni*

#### *School of Mathematics*

<i>Name</i>	<i>Period</i>	<i>Current Affiliation</i>	<i>Position</i>
Bae, Hyeong Ohk	03/01/1998-02/28/1999	Ajou University	Professor
Byeon, Dong Ho	03/01/1998-08/31/2001	Seoul National University	Professor
Byeon, Jaeyoung	07/01/1997-07/31/1998	Pohang University of Science and Technology	Professor
Choi, Youn-Seo	06/14/1999-02/28/2001	Korea University	Professor
Cho, Jin- Hwan	04/01/2000-03/31/2004	Suwon University	Professor
Choi, Youngook	01/01/2000-04/30/2003	Korea Advanced Institute of Science and Technology	Research Fellow
Grinenko, Mikhail	01/10/2001-01/16/2002	Steklov Institute of Mathematics	Professor
Hong, Jaehyun	09/01/2000-08/15/2003	University of California, Berkeley	Research Fellow
Hong, Jin	09/01/2000-09/22/2002	Electronics and Telecommunications Research Institute	Researcher
Potemine, Igor	06/01/1997-06/21/1998	Universite Toulouse	Professor
Joe, DoSang	09/01/2003-02/29/2004	Konkuk University	Professor
Kang, Seok-Jin	07/01/2001-08/20/2004	Seoul National University	Professor
Kim, Chang-Heon	11/01/2003-02/29/2004	Seoul Women's University	Professor
Kim, Hong Chan	03/15/2000-08/31/2000	Korea University	Professor
Kim, InKang	11/01/1996-01/31/1997	Seoul National University	Professor
Kim, Joonil	03/07/2000-07/12/2001	Chung-Ang University	Professor
Kim, Kyung Hee	08/01/1998-02/28/2001	Seoul National University	Research Fellow
Kim, Minhyong	06/01/2001-05/31/2002	University of Arizona	Professor
Kim, NamKwon	09/15/2000-02/29/2004	Seoul National University	Research Assistant Professor
Kim, Seok-Woo	04/01/2000-08/31/2002	Konkuk University	Professor
Kim, Sung Guen	08/01/1998-02/28/1999	Kyungpook National University	Professor
Koh, Jee Heub	01/01/1998-01/31/2000	Indiana University	Professor
Ku, Hyaе Jin	09/01/1998-06/15/2001	York University	Professor
Kwak, Sijong	10/01/1996-09/31/1999	Korea Advanced Institute of Science and Technology	Professor
Kwon, Dae Sung	04/08/1999-02/28/2001	Electronics and Telecommunications Research Institute	Researcher
Kwon, Jae Hoon	09/01/2001-03/29/2003	University of Seoul	Professor

## ALUMNI

Lee, Jae Sung	03/15/1999-03/14/2001	Sogang University	Professor
Lee, Junho	06/01/2004-07/31/2004	Michigan State University	Research Fellow
Lee, Sang Jin	03/01/2002-08/31/2003	Konkuk University	Professor
Lee, Seunghun	09/01/1998-08/31/1999	Konkuk University	Professor
Lee, Yong Ha	10/01/1999-08/31/2000	Ewha Womans University	Professor
Lee, Yongnam	09/01/1997-08/31/1999	Sogang University	Professor
Moon, Dongho	08/01/1998-02/28/1999	Sejong University	Professor
Ochi, Yoshihiro	10/01/2000-05/19/2003	Tokyo Denki University	Professor
Oh, Jang Heon	08/01/1997-12/30/1999	Sejong University	Professor
Imanuvilov, Oleg Y.	12/01/1996-08/22/1998	Iowa State University	Professor
Ouyang, Yong	07/01/2000-06/30/2002		
Paeng, Sung Hoon	03/01/1998-08/31/2000	Konkuk University	Professor
Park, Jin Sung	07/15/1998-08/10/2000	University of Bonn	Researcher
Park, Mi Hee	09/01/2003-08/31/2004	Chung-Ang University	Professor
Rim, Kyung Soo	02/01/1998-12/30/2001	Sogang University	Professor
Winkelmann, Jorg	10/1/2001-12/31/2002	Universite Nancy	Professor
Yoon, Jeong Rok	03/12/2001-03/12/2002		
Yun, Ki-Heon	07/23/2001-07/22/2003	Konkuk University	Research Fellow

### *School of Physics*

<i>Name</i>	<i>Period</i>	<i>Current Affiliation</i>	<i>Position</i>
Ahn, Sang-Hyeon	09/01/2001-06/30/2004	Korea Astronomy & Space Science Institute	Researcher
Akeroyd, Andrew	04/01/2001-10/31/2003	KEK	Researcher
Baek, Seungwon	08/01/2001-08/31/2004	University of Montreal	Research Fellow
Chang, Heon-Young	11/15/1999-11/14/2003	Kyungpook National University	Professor
Chen, Xiao-Shuang	08/03/1998-09/27/1999	Humboldt	Research Fellow
Choi, Mahn-Soo	10/01/2000-08/31/2002	Korea University	Professor
Choi, Seong-Youl	10/01/1998-02/29/2000	Chonbuk National University	Professor
Cornell, Alan	10/23/2002-10/22/2004	Yukawa Institute	Research Fellow
Deng, Zhen-Yan	07/06/1998-03/31/1999	National Institute for Materials	Visiting Researcher
Gusliencko, K. Y.	10/07/1998-11/17/2001	Seagate Technology	Professor
Hong, HyunSuk	11/01/2001-08/31/2004	Chonbuk National University	Professor
Hyun, Seungjoon	03/01/1998-04/05/2001	Yonsei University	Professor
Kang, Sin Kyu	10/01/1997-09/30/2001	Seoul National University	Research Assistant Professor

## ALUMNI

---

Kiem, Youngjai (deceased)	10/01/1997-09/30/2000	Korea Advanced Institute of Science and Technology	Professor
Kim, Chanju	09/01/1998-04/05/2001	Ewha Womans University	Professor
Kim, Hyung Do	02/05/2001-06/30/2003	Seoul National University	Professor
Kim, Jae Kwon	08/20/1998-10/29/2000		
Kim, Se Yong	09/01/1997-02/28/1998	Sejong University	Professor
Kim, Tae Suk	08/01/1997-07/31/1999	Seoul National University	Research Assistant Professor
Kwon, Hwang-hyun	05/01/2002-04/30/2004	Center for Nanotube and Nanostructured Composites, Sungkyunkwan University	Research Fellow
Lee, Chang Hwan	09/01/2000-02/28/2002	Pusan National University	Professor
Lee, Hyun-Woo	11/01/1999-04/30/2002	Pohang University of Science and Technology	Professor
Lee, In-ho	07/01/1998-06/17/2001	Korea Research Institute of Standards and Science	Research Fellow
Lee, Jae Sik	09/01/1998-10/31/2000	Manchester University	Research Fellow
Lee, Kang Young	06/19/2000-09/24/2003	Korea Advanced Institute of Science and Technology	Research Fellow
Lee, Sangmin	12/01/1998-04/08/2002	University of London Imperial College	Research Fellow
Liu, Chun	06/24/1998-08/28/1999	Institute of Theoretical Physics in Beijing	Professor
Liu, Qui-Yu	10/01/2000-07/02/2002	Tsinghua University	Professor
Michishita, Yoji	04/01/2001-03/25/2004	CERN, Geneva in Switzerland	Research Fellow
Park, Jeong-Hyuck	03/15/1999-03/14/2003	Institut des Hautes Etudes Scientifiques	Research Fellow
Park, Seung Yong	03/12/2001-03/10/2002	Ohio State University	Research Fellow
Rho, Mannque	01/01/2002-12/31/2003	Saclay	Emeritus Professor
Shin, Hyunjoon	05/01/1998-04/30/2002	Sungkyunkwan University	Research Assistant Professor
Sim, Heung-Sun	10/14/2001-08/31/2004	Korea Advanced Institute of Science and Technology	Professor
Song, Jeong-hyeon	01/01/2001-08/31/2003	Konkuk University	Professor
Yee, Jung-Tay	09/03/2001-01/31/2004	Amsterdam University	Research Fellow
Yi, Hangmo	10/01/2000-02/29/2004	Soongsil University	Professor
Yi, Insu	09/01/1999-08/31/2002	Novin International	CEO

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## ALUMNI

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### *School of Computational Sciences*

<i>Name</i>	<i>Period</i>	<i>Current Affiliation</i>	<i>Position</i>
Hong, Seung Jun	05/07/2001-07/31/2002		CEO
Kim, Saejoon	06/07/2002-03/06/2004	Yonsei University	Research Assistant Professor
Kwon, Sungchul	10/01/2002-02/25/2003	Kyung Hee University	Research Fellow
Lee, Julian	07/23/2001-02/28/2003	Soongsil University	Professor
Lee, Soojoon	10/01/2002-08/31/2004	Kyung Hee University	Professor
Oh, Byeong-Kweon	11/15/2002-02/28/2003	Sejong University	Professor
Park, Kibeom	10/16/2000-01/31/2002	Electronics and Telecommunications Research Institute	Researcher
Quan, WuYan	01/01/2001-02/14/2004	Fudan University	Professor
Yu, HoSeog	09/01/2000-08/31/2004	Yonsei University	Research Assistant Professor

## ASSOCIATE MEMBERS

---

### *Associate Members*

#### *School of Mathematics*

<i>Name</i>	<i>Affiliation</i>	<i>Period</i>
Baek, Jeong-Seon	Chonnam National University	08/01/2003-06/30/2005
Bak, Jong-Guk	Pohang University of Science and Technology	01/01/2002-12/31/2005
Byun, Dong Ho	Seoul National University	01/01/2002-12/31/2005
Byun, Yanghyun	Hanyang University	01/01/2002-12/31/2005
Chae, Dongho	Sungkyunkwan University	01/01/2002-12/31/2005
Chae, Hee Jun	Chungang University	09/01/2004-12/31/2006
Cheon, Jung Hee	Seoul National University	08/01/2003-06/30/2005
Cho, Hong Rae	Pusan National University	08/01/2003-06/30/2005
Cho, Sanghyun	Sogang University	08/01/2003-06/30/2005
Choe, Jaigyoung	Seoul National University	01/01/2002-12/31/2005
Choi, Youn-Seo	Korea University	01/01/2002-12/31/2005
Choie, YongJu	Pohang University of Science and Technology	01/01/2002-12/31/2005
Hahn, Sang Geun	Korea Advanced Institute of Science and Technology	01/01/2002-12/31/2005
Han, Chong Kyu	Seoul National University	07/01/2003-06/30/2005
Kang, Byung Gyun	Pohang University of Science and Technology	08/01/2003-06/30/2005
Kang, Hyeonbae	Seoul National University	08/01/2003-06/30/2005
Ki, Haseo	Yonsei University	08/01/2003-06/30/2005
Kim, Changho	Seoul National University	01/01/2002-12/31/2005
Kim, Dae San	Sogang University	01/01/2002-12/31/2005
Kim, Hoil	Kyungpook National University	01/01/2002-12/31/2005
Kim, Hong Chan	Korea University	01/01/2002-12/31/2005
Kim, Jongsu	Sogang University	01/01/2002-12/31/2005
Kim, Kang-Tae	Pohang University of Science and Technology	01/01/2002-12/31/2005
Kim, Myung-Hwan	Seoul National University	01/01/2002-12/31/2005
Kim, Seok-Woo	Chosun University	08/01/2003-06/30/2005
Kim, Young Hoon	Seoul National University	01/01/2002-12/31/2003
Kim, Young-One	Sejong University	01/01/2002-12/31/2005
Koh, Sung-Eun	Konkuk University	08/01/2003-06/30/2005
Kwak, Minkyu	Chonnam National University	08/01/2003-06/30/2005
Kwak, Sijong	Korea Advanced Institute of Science and Technology	07/01/2003-06/30/2005
Kwon, Jae-Hoon	University of Seoul	08/01/2003-06/30/2005

## ASSOCIATE MEMBERS

---

Kyae, Seung-Hyeok	Seoul National University	08/01/2003-06/30/2005
Lee, Hyung-Chun	Ajou University	08/01/2003-06/30/2005
Lee, Ki-Ahm	Seoul National University	08/01/2003-06/30/2005
Lee, June-Yub	Ewha Womans University	01/01/2002-12/31/2005
Lee, Jung Seob	Ajou University	08/01/2003-06/30/2005
Lee, Seunghun	Konkuk University	01/01/2002-12/31/2005
Lee, Yongnam	Sogang University	07/01/2003-06/30/2005
Lee, Yong Ha	Ewha Womans University	08/01/2003-06/30/2005
Lee, Woo Young	Seoul National University	08/01/2003-06/30/2005
Lim, Yong Do	Kyungpook National University	08/01/2003-06/30/2005
Moon, Dongho	Sejong University	01/01/2002-12/31/2005
Oh, Byeong-Kweon	Sejong University	08/01/2003-06/30/2005
Park, Jihun	Pohang University of Science and Technology	08/01/2003-06/30/2005
Park, Jongil	Seoul National I University	01/01/2002-12/31/2005
Park, Joon Sang	Dongguk University	08/01/2003-06/30/2005
Ryu, Jeong Seog	Hongik University	08/01/2003-06/30/2005
Seo, Jin Keun	Yonsei University	01/01/2002-12/31/2005
Shin, Dong Kwan	Konkuk University	01/01/2002-12/31/2005
Suh, Dong Youp	Korea Advanced Institute of Science and Tehnology	01/01/2002-12/31/2005
Yim, Jin Whan	Korea Advanced Institute of Science and Tehnology	01/01/2002-12/31/2005
Lee, Sang Jin	Konkuk University	09/01/2004-12/31/2006
Ki, Jun Il	Chungang University	09/01/2004-12/31/2006
Park, Mee Hee	Chungang University	09/01/2004-12/31/2006
Kim, Sun Chul	Chungang University	09/01/2004-12/31/2006
Ku, Ja Kyung	Korea Advanced Institute of Science and Tehnology	09/01/2004-12/31/2006
Bae, Sung Han	Korea Advanced Institute of Science and Tehnology	09/01/2004-12/31/2006
Kim, Jin Hong	Korea Advanced Institute of Science and Tehnology	09/01/2004-12/31/2006
Lee, Seung Hoon	Youngdong University	09/01/2004-12/31/2006
Kwak, Min Kyu	Chonnam University	09/01/2004-12/31/2006

### *School of Physics*

<i>Name</i>	<i>Affiliation</i>	<i>Period</i>
Ahn, Changhyun	Kyungpook National University	09/01/2002-12/31/2004
Ahn, Changrim	Ewha Womans University	09/01/2002-12/31/2004

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## ASSOCIATE MEMBERS

---

Bak, Dongsu	University of Seoul	06/01/2002-12/31/2004
Cha, Min-Chul	Hanyang University	09/01/2002-12/31/2004
Chang, Kee Joo	Korea Advanced Institute of Science and Technology	09/01/2002-12/31/2004
Choi, Han Yong	Sungkyunkwan University	09/01/2002-12/31/2004
Choi, Junegone	Korea University	09/01/2002-12/31/2004
Choi, Ki Woon	Korea Advanced Institute of Science and Technology	09/01/2002-12/31/2004
Choi, Mahn-Soo	Korea University	09/01/2002-12/31/2004
Choi, Moo Young	Seoul National University	09/01/2002-12/31/2004
Choi, Seong-Youl	Chonbuk National University	06/01/2002-12/31/2004
Chung, Myung-Hoon	Hongik University	09/01/2002-12/31/2004
Hong, Deog Ki	Pusan National University	09/01/2002-12/31/2004
Hyun, Seungjoon	Yonsei University	06/01/2002-12/31/2004
Ihm, Jisoon	Seoul National University	09/01/2002-12/31/2004
Jeong, Hyeong-Chai	Sejong University	08/01/2003-07/31/2005
Kim, Yup	Kyung Hee University	11/01/2002-12/31/2004
Kim, Beon Jun	Ajou University	06/01/2002-12/31/2004
Kim, Bong Soo	Changwon University	08/01/2003-07/31/2005
Kim, Choong Sun	Yonsei University	09/01/2002-12/31/2004
Kim, Doochul	Seoul National University	09/01/2002-12/31/2004
Kim, Jihn Eui	Seoul National University	09/01/2002-12/31/2004
Kim, Jin Min	Soongsil University	11/01/2002-12/31/2004
Kim, Se Yong	Sejong University	09/01/2002-12/31/2004
Kim, Seunghwan	Pohang University of Science and Technology	09/01/2002-12/31/2004
Kim, Yoonbai	Sungkyunkwan University	09/01/2002-12/31/2004
Ko, Pyungwon	Korea Advanced Institute of Science and Technology	09/01/2002-12/31/2004
Kwon, Yong-kyung	Konkuk University	09/01/2002-12/31/2004
Lee, Bum Hoon	Sogang University	09/01/2002-12/31/2004
Lee, Chang-Yeong	Sejong University	09/01/2002-12/31/2004
Lee, Choonkyu	Seoul National University	09/01/2002-12/31/2004
Lee, Chul Hoon	Hanyang University	09/01/2002-12/31/2004
Lee, Hyun Kyu	Hanyang University	09/01/2002-12/31/2004
Lee, Taejin	Kangwon University	09/01/2002-12/31/2004
Myung, Yun Soo	Inje University	09/01/2002-12/31/2004
Nam, Soonkeon	Kyung Hee University	09/01/2002-12/31/2004
No, Jae-Dong	Chungnam National University	08/01/2003-07/31/2005
Oh, Phillial	Sungkyunkwan University	09/01/2002-12/31/2004
Park, Q-Han	Korea University	09/01/2002-12/31/2004
Salk, Sung-Ho	Pohang University of Science and Technology	09/01/2002-12/31/2004

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## ASSOCIATE MEMBERS

---

Sin, Sang-Jin	Hanyang University	09/01/2002-12/31/2004
Song, Hee Sung	Seoul National University	09/01/2002-12/31/2004
Um, Chung In	Korea University	09/01/2002-12/31/2004
Yang, S.-R. Eric	Korea University	09/01/2002-12/31/2004
Yeo, Joon-hyun	Konkuk University	09/01/2002-12/31/2004
Yu, Jaejun	Seoul National University	09/01/2002-12/31/2004
Yi, Hang Mo	Soongsil University	04/01/2004-12/31/2005
Song, Jung Hyeon	Konkuk University	04/01/2004-12/31/2005
Kim, Nak Woo	Kyung Hee University	04/01/2004-12/31/2005
Park, Jeong Man	Catholic University	04/01/2004-12/31/2005
Shim, Heong Sun	Korea Advanced Institute of Science and Technology	09/01/2004-12/31/2006
Hong, Hyun Suk	Chunbuk National University	09/01/2004-12/31/2006

### *School of Computational Sciences*

<i>Name</i>	<i>Affiliation</i>	<i>Period</i>
Chang, Iksoo	Pusan National University	11/01/2001-12/31/2005
Lee, In-ho	Korea Research Institute of Standards and Science	09/01/2002-12/31/2004
Lee, Julian	Soongsil University	03/01/2003-12/31/2004
Lee, Sang Bub	Kyungpook National University	12/01/2003-12/31/2005
Lee, Sung Jong	Suwon University	01/01/2001-12/31/2005
Oh, Sung Dahm	Sookmyung Women's University	08/01/2002-07/31/2005
Shin, Hang-Chul	Soongsil University	09/01/2002-12/31/2004
Sung, Wokyung	Pohang University of Science and Technology	01/01/2001-12/31/2005
Kim, Kisik	Inha University	02/01/2004-12/31-2005
Lee, Jin Hyung	Hanyang University	02/01/2004-12/31/2005
Noh, Jaewoo`	Inha University	03/01/2004-12/31/2005
Lee, Hae Woong	Korea Advanced Institute of Science and Technology	04/01/2004-12/31/2005
Kim, Yoon Ho	Pohang University of Science and Technology	06/01/2004-12/31/2005
Cho, Young Tak	Kwangju University	06/01/2004-12/31/2005

## MUTUAL AGREEMENT

---

### *Mutual Agreement*

- Mathematical Sciences Research Institute (MSRI), Berkeley (May 1999)
- Institute for Advanced Study (IAS), Princeton (June 1999)
- Korea University (October 1999)
- Institute of Particle and Nuclear Studies, KEK (November 1999)
- Ewha Womans University (December 1999)
- Research Institute for Mathematical Sciences (RIMS) (March 2000)
- National Center for Theoretical Sciences (NTCS), Taiwan (March 2000)
- Information Center for Mathematical Sciences, Korea (June 2000)
- Information Center for Physics Research, Korea (June 2000)
- Johns Hopkins University (September 2000)
- Yonsei University (January 2001)
- Sogang University (February 2001)
- Korea Institute of Science and Technology Information (November 2001)
- Pacific Institute for the Mathematical Sciences (December 2001)
- Sungkyunkwan University (April 2002)
- Mongolian Academy of Sciences (December 2002)
- Kyung Hee Universtiy (October 2003)
- Nagoya University (February 2004)
- Korean Academy of Science and Technology (April 2004)
- The Astrophysical Research Consortium (ARC) (June 2004)
- Sejong University ARCSEC Center (June 2004)
- Korea Research Institute of Standards and Science (KRISS) (September 2004)
- Hanyang University (October 2004)
- Korea Atomic Energy Research Institute (KAERI) (November 2004)
- Korea Institute of Science and Technology (KIST) (December 2004)

### *KIAS, a Member of SIG*

Science Institutes Group (SIG) is an organization of research institutions, which exemplify the characteristics desired for Millennium Science Institutes. SIG seeks to ensure that Institutes are led by excellent scientists who work at the frontiers of research and are also equipped to apply their research to economic, environmental, agricultural, and health needs of the country and region; in some cases they will apply modern sciences to develop indigenous technologies. Specific activities of SIG are to provide strategic direction, scout for potential new Institutes, seek financial support, publicize the Millennium Science Initiative, and organize an annual scientific meeting. SIG is serving in a leadership position in the Third World Academy of Sciences and the International Council of Scientific Unions.

The founding members of SIG are Korea Institute for Advanced Study (KIAS) Seoul, Korea, Instituto de Matematica Pura e Aplicada (IMPA) Rio de Janeiro, Brazil, Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, India and Institute for Advanced Study, Princeton, New Jersey, USA.

## TEA TIME

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Tea Time

Every weekday, there is a tea time at the KIAS discussion room

## REPORT OF PRESIDENT

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