

## Tsinghua University Mathematical Sciences Center Newsletter

In the past three months, the MSC had been busy hosting its summer programs for a large number of international students and visiting professors. It was also the time to prepare the arrival of five new full-time members. In July, it began to move to its new home in Jin Chun Yuan West Wing. It also launched four Distinguished Lecture series to push its goal of educating the publics and students of all levels with frontier mathematics. It will continue to recruit full-time members, and will recruit graduate students worldwide. This newsletter will highlight some of its recent and future activities. For more information about the MSC, visit [msc.tsinghua.edu.cn](http://msc.tsinghua.edu.cn).

### Graduate students recruitment

2011-2012 graduate students' recruitment has begun. MSC welcome those who would like to study further in mathematics to apply. Currently MSC plan to recruit from the following 3 programs.

01 Pure mathematics

Professors with thesis directorship: Shing Tung Yau, Yat-Sun Poon, Abul Masood-ul-Alam

02 Computational mathematics and geometric imaging

Professors with thesis directorship: Shing Tung Yau, Jian Sun

03 Applied Mathematics

Professors with thesis directorship: Ning Jiang

Applicants can choose either professor or program.

Beginning from 2011-2012, Prof Tao Luo and Zuoqiang Shi will join the applied mathematics program.

Prof Ben Andrews John Fornaess will be included in the team.

For more information, please visit <http://yz.tsinghua.edu.cn/>

### Distinguished Lecture Series

On July 13 2011, MSC launched four Distinguished Lecture series named after four mathematicians: Shiing-Shen Chern, Loo-Keng Hua, Pao-Lu Hsu and Chia-Chiao Lin. Each year, selection Committee will select the individuals who have made outstanding contributions for the development of relevant academic fields. The awardees will be invited to deliver a speech at MSC.

**Shiing-Shen Chern Distinguished Lecture**

Inaugural speaker: Richard Schoen (Stanford University) (Tentative date: September 22, 29, October 13)

**Chia-Chiao Lin Distinguished Lecture**

Inaugural speaker: Stan Osher (UCLA)

**Loo-Keng Hua Distinguished Lecture**

Speaker: Wilfried Schmid (Harvard University)

**Loo-Keng Hua Distinguished Lecture**

Inauguration speaker: Cedric Villani (Université Claude Bernard Lyon 1, Directeur de l'Institut Henri Poincaré)

**Pao-Lu Hsu Distinguished Lecture**

Inauguration speaker: Bradley Efron (Stanford University)





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### Visitor Programs

The MSC has a strong summer program in the past two years. Our programs could be grouped into three overlapping clusters: 1. number theory, representation and algebra, 2. Geometric Imaging, 3. Geometry, Topology and Analysis. In 2011-2012, the MSC's visitors include E. Looijenga, R. Schoen, Futaki and many others. They will all visit for at least one month to deliver mini-courses. E. Looijenga will visit and teach a graduate course for a full semester. R. Schoen will visit for at least three months. To check the MSC's latest visitor list, please visit <http://msc.tsinghua.edu.cn/visitor/visitor.aspx>

### Eduard Looijenga

Professor Looijenga received his PhD in 1974. He served as a Professor at the University of Nijmegen and the University of Amsterdam. He was a Visiting professor at the University of Michigan (Ann Arbor) and the University of Utah (Salt Lake City). He has been a Professor at the University of Utrecht Since 1991. Professor Looijenga's research started in singularity theory, but migrated via Torelli problems to locally symmetric varieties, then to mapping class groups and moduli spaces of curves, while his recent work is concerned with automorphic forms with poles along Heegner divisors. One of his major works is a solution of the Zucker conjecture concerning identification of the  $L^2$ -cohomology of an arithmetic Hermitian locally symmetric space and the intersection cohomology of the Baily-Borel compactification of the space. Looijenga was an invited speaker at the ICM in 1978 and at the ECM in 1992. He is currently editor of Journal of Computational Mathematics, Michigan Mathematics Journal and the Journal of the European Mathematics Society. Professor Looijenga will come to MSC to teach a course on Moduli spaces of curves this fall.

### Richard Schoen

Professor Richard Schoen received his PhD in 1977 from Stanford University where he is currently the Anne T. and Robert M. Bass Professor of Humanities and Sciences. Professor Schoen is a world leading expert in differential geometry and general relativity. In 1979, together with Shing-Tung Yau, he proved the fundamental positive mass theorem in general relativity. In 1984, he obtained a complete solution to the Yamabe problem on compact manifolds. This work combined new techniques with ideas developed in earlier work with Yau, and partial results by Thierry Aubin and Neil Trudinger. More recently, using Hamilton's Ricci flow, Simon Brendle and Richard Schoen in 2007 proved the famous  $1/4$ -pinching differentiable sphere theorem, a fundamental result in the study of manifolds of positive sectional curvature which was open for about 50 years. Professor Schoen received a MacArthur Fellowship in 1983, the Bôcher Memorial Prize in 1989, and won a Guggenheim Fellowship in 1996. He is a member of the US National Academy of Sciences and the American Academy of Arts and Sciences. Professor Schoen will visit MSC in the mid September, 2011.



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### New Members

The MSC has five full-time members since January 2010. Beginning in the fall semester 2011, five persons will join the MSC as full-time at various ranks. In addition, the MSC will have two post-doctoral fellows for 2011-2012. Prof John Fornaess of University of Michigan will soon join the MSC as a full-time member. The MSC will continue its recruitment campaign. With a good spectrum of full-time members, the MSC will also begin recruiting graduate students this year.



Professor John Erik Fornaess was born in Norway in 1946. He received his PhD in 1974 in University of Washington. He joined Princeton University as an instructor in 1974 immediately after his PhD program, and left Princeton in 1991 as a Professor. He has been a professor of University of Michigan ever since.

John Erik Fornaess is one of the very top leading figures in the subject of Several Complex Variables and Complex Geometry in our time. His scientific impact has been long lasting. For decades, his mathematical work has been influencing many research directions in the subject of Several Complex Variables and Complex Geometry. He was an ICM invited speaker in 1983 and a Bergman prize winner in 1994. He served several times the AMS prize selection committees, including the very prestigious AMS Steel Prize Selection Committee in 2011.

Dr.Fornaess has been also extremely successful in training young mathematicians. He might well be the mathematician who has trained most Ph D students and Post-doctors in the field of Several Complex Variables in the past 25 years. He is one of the few mathematicians who can work with junior people of any level. Beginning 2011-2012, Professor Fornaess is a member of the MSC.

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Professor Zuoqiang Shi got his Ph.D in Applied Mathematics at Zhou Pei-yuan Center for Applied Mathematics, Tsinghua University in 2008 under the supervision of Prof. ThomasY.Hou. He received his B.S. in Mathematics at Tsinghua University in 2003. He was a postdoctoral Scholar in Applied & Computational Mathematics at Caltech. His research interests focus on nonlinear and non-stationary data analysis, singularity problems in fluid mechanics, numerical analysis and computation of Immersed Boundary Method, nonlinear wave phenomena in periodic media. His publication appears in Journal of Computational Physics, Physical Review A, Physical Review E, Archive for Rational Mechanics and Analysis and Advances in Adaptive Data Analysis etc. He gave invited talk at regional AMS meeting 2010. Dr. Shi will be an associate Professor of MSC beginning this year.

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Dr. Feng Fu received his B.Sc. in Theoretical and Applied Mechanics at Fudan University in 2004. He got his Ph.D. in Dynamics and Control at Peking University in 2010 under the supervision of Prof. Long Wang and Prof. Martin A. Nowak. His thesis title is Evolutionary games and evolution of cooperation. Before joining MSC, he was a Post-doctoral research fellow of Program for Evolutionary Dynamics at Harvard University. His research is focused on mathematical description of evolutionary processes transcending disciplinary boundaries. He is primarily interested in theoretical aspects of probability and stochastic processes, and their intersections with evolutionary game theory, adaptive dynamics, coalescent theory and infectious disease modeling. His recent research activities include evolutionary graph theory, evolution of social behaviors (cooperation, in-group bias, and vaccination behavior), social networks, epidemiology, and the evolution of eusociality. He will be a lecturer of the MSC beginning in 2011-2012.



Dr. Shenghao Sun got his Ph.D., at Department of Mathematics, University of California at Berkeley in 2010 under the supervision of Professor Martin Olsson. He received his B.S. in Mathematics at Zhejiang University in 2005. Before joining MSC, he was a post-doc researcher at Centre de mathématiques Laurent Schwartz - UMR 7640 Ecole polytechnique. His research interests are Arithmetic algebraic geometry, in particular zeta functions and  $p$ -adic cohomology of (modular) stacks, weight theory, and independence of  $L$  for stacks over finite fields. He will be a lecturer of the MSC beginning in 2011-2012.



Dr. Minxian Zhu got her Ph.D. in Mathematics at Yale University in 2008. She received her B.S. in Mathematics, at University of Science and Technology of China in 2001. She was an Instructor at Yale University from 2004 to 2007. Before joining in MSC, she was a hill Assistant Professor at Rutgers University since 2008. Her research interests are Representation theory, infinite-dimensional Lie algebras, vertex operator algebras, quantum groups, and their applications. Her publications appear in *Advances in Mathematics* and she was coauthor with Igor Frenkel. She will be a lecturer of the MSC beginning in 2011-2012.



Dr. Hang Wang got her Ph.D. at the Department of Mathematics at the Vanderbilt University in 2011. Her advisor is Professor Gennadi Kasparov. She is working in the area of index theory and non-commutative geometry. The title of her PHD thesis is " $L^2$ -index formula for proper cocompact group actions". She will be a post-doc research fellow of the MSC beginning in 2011-2012.



Dr. Guangyu Guo got his Ph.D. from Department of physics & astronomy of Texas A&M University under the supervision of Professor Katrin Becker in 2010. His thesis title is "Higher Derivative D-brane Couplings". He will be a post-doc research fellow of the MSC beginning in 2011-2012.