School and Workshop on Gauge Theories and Differential Invariants

30 September - 11 October 2019
Trieste, Italy

Further information:
http://indico.ictp.it/event/8273/
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The main focus is on recent developments in gauge theories, both in theoretical physics and in mathematics. This area is very fruitful for active interplays between Mathematics and Physics.

Description:

In theoretical physics exact results in supersymmetric quantum field theories and superstrings on curved backgrounds prompted the interest in explicit calculations of (equivariant) Donaldson invariants also in higher rank and the possible definition of new invariants for four manifolds using non-Lagrangian theories. On the mathematical side, new results have been obtained for higher rank Donaldson invariants and Vafa-Witten invariants. A key role is played by the interplay of with representation theory and quantum integrable systems. These developments are also expected to have impact on enumerative geometry, knot theory and representation theory of infinite dimensional algebras. A key technical tool in these developments is equivariant localization which allows the extraction of exact results.

Topics:

- higher rank Donaldson invariants;
- Vafa-Witten invariants;
- Donaldson-Thomas invariants;
- study of the BPS spectra of (non Lagrangean) N=2 Gauge Theories and new four-dimensional invariants;
- relation to matrix models and topological strings;
- quantum Hitchin systems and character varieties;
- gauge theories on complex toric surfaces and their instanton moduli spaces;
- surface operators in gauge theory and moduli spaces of principal bundles with parabolic structure;
- quantum cohomology of the instanton moduli space;
- K-theory of quiver varietes;
- quantum integrability, quantum Yang-Baxter equations;
- relations to knot theory and Khovanov Homology;
- higher dimensional supersymmetric gauge theories and M-theory.

Directors:

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Local Organizer:

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Lecturers:

L. GÖTTSCHE, ICTP
G. MOORE, Rudgers (tbc)
H. NAKAJIMA, Kavli IPMU
N. NEKRASOV, Simons Center (tbc)
P. PUTROV, ICTP

Speakers include:

A. DAEMI, Simons Center
A. GOLAMPOUR, University of Maryland
S. GUKOV, Caltech
S. JEONG, Stony Brook
A. KLEMM, Universität Bonn
M. KOOL, Utrecht University
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A. MELLIT, Universität Wien
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D. PEI, Caltech
Z. RUIDONG, Tokyo University
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Y. TANAKA, Oxford University
K. YOSHIOKA, Kobe Unversity

How to apply:

Online application:
http://indico.ictp.it/event/8273/

Female scientists are encouraged to apply.

Grants:

A limited number of grants are available to support the attendance of selected participants, with priority given to participants from developing countries. There is no registration fee.

Deadlines:

For applications needing financial support and/or visa:
15 June 2019

For applications not needing financial support and/or visa:
1 September 2019

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