

MEETING OF MODERN SCIENCE AND SCHOOL PHYSICS

SMR 2234

TITLES OF LECTURES

A. Modern Physics from the First Hands

1. *The century jubilee of superconductivity*, **Andrey Varlamov** (SPIN-CNR, University "Tor Vergata", Rome, Italy) .
2. *Toward quantum computer*, **Boris Altshuler**, Columbia University, NY, USA).
3. *Introduction to nano-physics*, **Yuri Galperin** (Oslo University, Oslo, Norway).
4. *Unraveling the mysteries of matter at the CERN Large Hadron Collider (LHC)*, **Booby Acharya**, (ICTP, Trieste, Italy).
5. *Acoustic and electromagnetic waves to the service of modern medicine*, **Cristiano Biagini** (Florence, Italy).
6. *Earthquakes and the Deformation of the Continents*, **Abdelkrim Aoudia**, (ICTP, Trieste, Italy).
7. *Cosmic inflation: conjectures vs. facts*, **Vyatcheslav Mukhanov** (Ludwig Maximilians Universitat, Munich, Germany).
8. *Excitons: artificial hydrogen atoms in crystals*, Alexey Kavokin, (University of Southampton, Southampton, UK).
9. *Photovoltaics and sun energy*, **Aldo di Carlo**, (University "Tor Vergata", Rome, Italy).
10. *How biology can help to teach physics*, **Konstantin Bogdanov**, (Russian Academy of Sciences, Moscow, Russia)
11. *Quest to absolute zero and Bose condensation*, **Alex Bouzdine**, (Bordeaux University, Bordeaux, France).
12. *Order and Chaos in metals*, **Boris Altshuler** (Columbia University, NY, USA).
13. *Information storage*, **Igor Lukyanchuk** (University of Picardie Julie Verne, Amiens, France)
14. *Econophysics: how can we describe a healthy economy and predict a financial crisis*, **Feodor Kusmartsev** (Loughborough University, UK) .
15. *Physics of flight (aerodynamics)*, **Albert L. Stasenko**, (Moscow Institute of Physics and Technology, Moscow, Russia).
16. *Tailoring of new materials*, **Giuseppe Balestrino** (University "Tor Vergata", Rome, Italy).

B. Physics around us

17. *Physics in a kitchen*, **Andrey Varlamov** (SPIN-CNR, University “Tor Vergata”, Rome, Italy).
18. *Physics of sailing*, **Laura Romano** (Universita’ di Parma, Parma, Italy).
19. *Physics in sport*, **Andrey Varlamov** (SPIN-CNR, University “Tor Vergata”, Rome, Italy).
20. *Physics has always been and should be a fantastic thing*, **Sergei Krotov**, Moscow State University, Moscow, Russia).
21. *Vision and Illusions*, **Alex Bouzdine** (Bordeaux University, Bordeaux, France).

C. Useful methods of “university” physics which can be adopted in “school” physics

22. *Dimensional analysis in school physics*, **Albert L. Stasenko**, (Moscow Institute of Physics and Technology, Moscow, Russia).
23. *The role of small parameter in physical problems*, **Sergei Krotov** (Moscow State University, Moscow, Russia).
24. *Method of virtual displacements*, **Alexei Chernoutsan** (Moscow Technological University, Moscow, Russia).
25. *Maxwells daemon and the second law of thermodynamics*, **Joakim Bergli** (Oslo University, Oslo, Norway).

D. Modern methods of teaching physics

- 26-27. (2 hours) *Engaging Students in the Learning Process in the Introductory Physics Course*, **David Sokoloff** (University of Oregon, Oregon, USA)
- 28-29. (2 hours) *Computer-Based Tools for Active Learning in the Introductory Physics Course*, **David Sokoloff** (University of Oregon, Oregon, USA)
30. *Science education in Russia*, **Lidia Ryabova** and **Igor Temkin** (Foundation "Contemporary Sciences", Moscow, Russia).

E. Visit of “Elettra” Synchrotron Light Source and other Facilities of the Trieste Research area

F. Saturday Evening Entertainment

31. *"No fear! Physics helps you"*, **Giovanni Filocamo** (Genova Festival of Science, Genova, Italy)

(Physical phenomena we observe in everyday life can be investigated in a creative way. The different parts of this lecture could be used as starting points in the introduction or in the application of several topics in the classroom).