



The Abdus Salam  
**International Centre  
for Theoretical Physics**



## Workshop on Nanophotonics

Cosponsor(s): Argonne National Laboratory (ANL), US National Science Foundation (NSF) and International Institute for Complex Adaptive Matter (ICAM-12CAM)

Organizer(s): F. CAPASSO, D. LOPEZ, E. ISAACS, A. FAINSTEIN. Local Organizer: E. TOSATTI  
Trieste - Italy, 03 - 07 December 2012

## Programme

**Monday, 3 December 2012** (Room:Leonardo da Vinci Building Main Lecture Hall)  
**Chairperson: Morning: F. CAPASSO Afternoon: H. ATWATER**

**3 December 2012**

- 08:15 - 08:50**      **REGISTRATION & ADMINISTRATIVE FORMALITIES**  
Main Entrance - Leonardo da Vinci Building
- 08:50 - 09:00**      **Erio TOSATTI, Federico CAPASSO, Daniel LOPEZ and Alex FAINSTEIN**  
**Welcome and Opening Remarks**
- 09:00 - 10:00**      **Atac IMAMOGLU / ETH Zurich, Switzerland**  
**Quantum photonics: Prospects for quantum information processing in nanophotonic structures**
- 10:00 - 10:15**      **Discussion time**
- 10:15 - 10:45**      --- COFFEE BREAK ---
- 10:45 - 11:15**      **Frank KOPPENS / Institut de Ciencies Fotoniques, Spain**  
**Graphene nano-photonics and carrier dynamics**
- 11:15 - 11:30**      **Discussion time**
- 11:30 - 12:00**      **Harald GIESSEN / Stuttgart University, Germany**  
**Three-dimensional complex plasmonic structures: Chirality, coupling and sensing applications**

12:00 - 12:15      **Discussion time**

12:15 - 14:00      --- LUNCH BREAK ---

14:00 - 15:00      **Xiang ZHANG / University of California at Berkeley, U.S.A.**  
**Photonics beyond diffraction limit: Plasmon waveguide, cavities and integrated laser circuits**

15:00 - 15:15      **Discussion time**

15:15 - 15:45      **Martin WEGENER / Karlsruhe Institut fuer Technologie, Germany**  
**Three-dimensional photonic metal materials**

15:45 - 16:00      **Discussion time**

16:00 - 16:30      --- COFFEE BREAK ---

16:30 - 17:00      **Cristian CIRACI / Duke University, U.S.A.**  
**Plasmonic metamaterials for optical applications (talk given on behalf of David R. Smith)**

17:00 - 17:15      **Discussion time**

19:00 - 22:00      --- WELCOME RECEPTION ---

**Tuesday, 4 December 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)**  
**Chairperson: Morning: L. NOVOTNY Afternoon: A. FAINSTEIN**

**4 December 2012**

09:00 - 10:00      **Vahid SANDOGHDAR / Max Planck Institute for the Science of Light, Germany**  
**On the efficient interaction of single photons and single emitters**

10:00 - 10:15      **Discussion time**

10:15 - 10:45      --- COFFEE BREAK ---

10:45 - 11:15      **Hatie ALTUG / Boston University, U.S.A.**  
**Metamaterials for multi-functional and ultra-sensitive mid-infrared spectroscopy**

11:15 - 11:30      **Discussion time**

11:30 - 12:00      **Enzo DI FABRIZIO / Fondazione Istituto Italiano di Tecnologia, Italy**  
**Different strategy for single molecule detection through nanoplasmonics**

12:00 - 12:15      **Discussion time**

12:15 - 14:00      --- LUNCH BREAK ---

14:00 - 15:00      **Michal LIPSON / Cornell University, U.S.A.**  
**High confinement silicon photonics**

15:00 - 15:15      **Discussion time**

15:15 - 15:45      **Kenneth CROZIER / Harvard University, U.S.A.**  
**Manipulating particles and enhancing spectroscopy with plasmonics and photonics**

- 15:45 - 16:00 Discussion time
- 16:00 - 16:30 **Daniel WASSERMAN** / *University of Illinois @ Urbana, U.S.A.*  
**Making the mid-IR Nano: The challenges and opportunities of mid-infrared plasmonics**
- 16:30 - 16:45 Discussion time
- 16:45 - 17:15 --- COFFEE BREAK ---
- 17:15 - 18:15 **Kerry VAHALA** / *Caltech, U.S.A.*  
**Nonlinear optics in high-Q micro-resonators**
- 18:15 - 18:30 Discussion time

Wednesday, 5 December 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)  
 Chairperson: Morning: Xiang ZHANG Afternoon: Daniel LOPEZ

5 December 2012

- 09:00 - 10:00 **Lukas NOVOTNY** / *ETH Zurich, Switzerland*  
**Optical antennas for enhanced light-matter interactions**
- 10:00 - 10:15 Discussion time
- 10:15 - 10:45 --- COFFEE BREAK ---
- 10:45 - 11:15 **Mikhail NOGINOV** / *Norfolk State University, U.S.A.*  
**Plasmonics with gain: From loss reduction to stimulated emission**
- 11:15 - 11:30 Discussion time
- 11:30 - 12:00 **Harry ATWATER** / *Caltech, U.S.A.*  
**Tuning plasmon resonances by electrochemical potential control**
- 12:00 - 12:15 Discussion time
- 12:15 - 14:00 --- LUNCH BREAK ---
- 14:00 - 14:30 **Jennifer DIONNE** / *Stanford University, U.S.A.*  
**Quantum, chiral and magnetic light-matter interactions**
- 14:30 - 14:45 Discussion time
- 14:45 - 15:15 **Gary WIEDERRECHT** / *Argonne National Laboratory, U.S.A.*  
**Nanophotonics for solar energy concentration and conversion**
- 15:15 - 15:30 Discussion time
- 15:30 - 16:00 **Yeshaiahu FAINMAN** / *University of California at San Diego, U.S.A.*  
**Nanophotonics technology and applications**
- 16:00 - 16:15 Discussion time
- 16:15 - 16:45 --- COFFEE BREAK ---

**16:45 - 18:15**      **POSTER SESSION**  
Poster Gallery - behind the Main Lecture Hall

**Thursday, 6 December 2012** (Room:Leonardo da Vinci Building Main Lecture Hall)  
**Chairperson: Morning: K. TSAKMAKIDIS Afternoon: M. NOGINOV**

**6 December 2012**

**09:00 - 10:00**      **Nikolay ZHELUDEV / University of Southampton, U.K.**  
**From metamaterials to metadevices**

**10:00 - 10:15**      **Discussion time**

**10:15 - 10:45**      --- COFFEE BREAK ---

**10:45 - 11:15**      **Zeno GABURRO / University of Trento, Italy**  
**Generalized reflection and refraction with phase discontinuities: Engineering Huygens, Fermat, Bragg and Fresnel laws**

**11:15 - 11:30**      **Discussion time**

**11:30 - 12:00**      **Vladimir SHALAEV / Purdue University, U.S.A.**  
**From metamaterials to metasurfaces**

**12:00 - 12:15**      **Discussion time**

**12:15 - 14:00**      --- LUNCH BREAK ---

**14:00 - 14:30**      **Marko LONCAR / Harvard University, U.S.A.**  
**Diamond nanophotonics and quantum optics**

**14:30 - 14:45**      **Discussion time**

**14:45 - 15:15**      **Daniel LOPEZ / Argonne National Laboratory, U.S.A.**  
**Manipulation of near field interactions with nano electro mechanical systems**

**15:15 - 15:30**      **Discussion time**

**15:30 - 16:00**      **Fernando STEFANI / University of Buenos Aires, Argentina**  
**Manipulating light, heat and forces at the nanoscale with metallic nanoparticles**

**16:00 - 16:15**      **Discussion time**

**16:15 - 16:45**      --- COFFEE BREAK ---

**16:45 - 18:15**      **POSTER SESSION**  
Poster Gallery - behind the Main Lecture Hall

**Friday, 7 December 2012** (Room:Leonardo da Vinci Building Main Lecture Hall)  
**Chairperson: Morning: D. COUWENBERG**

**7 December 2012**

**09:00 - 10:00**      **Peter VUKUSIC / University of Exeter, U.K.**  
**All things bright and beautiful: Photonics in biological systems**

**10:00 - 10:15**      **Discussion time**

**10:15 - 10:45**      --- COFFEE BREAK ---

**10:45 - 11:15**      **Olivier MARTIN / EPFL, Switzerland**  
**Fano resonant plasmonic systems: Functioning principles and applications for sensing**

**11:15 - 11:30**      **Discussion time**

**11:30 - 12:00**      **Andrea FRATALOCCHI / KAUST, Saudi Arabia**  
**A brief lecture on Complex Photonics: from chaotic energy harvesting to diffractionless fields generated by self-similarity**

**12:00 - 12:15**      **Discussion time**

**12:15 - 14:00**      --- LUNCH BREAK ---

**14:00 - 15:00**      **Federico CAPASSO / Harvard University, U.S.A.**  
**Flat optics**

**15:00 - 15:15**      **Discussion time**

**15:15 - 15:30**      **Closing Remarks and Conclusion**