

## ORAL COMMUNICATIONS

26 May 2014

Contributed Talks Session 1

16:00 – 17:20

Jussieu Amphitheatre

O01

### The Nucleation and Growth of Colloidal Quantum Dots

Jonathan Owen<sup>1,\*</sup> Alex Beecher<sup>1</sup>

<sup>1</sup>Chemistry, Columbia University, New York, United States

O02

### Ligand-Free Colloidal Quantum Dots for Optoelectronics and Luminescence Sensors

Angshuman Nag<sup>1,\*</sup> M. Jagadeeswara Rao<sup>1</sup> Kiran P. Kadlag<sup>1</sup> Abhishek Swarnkar<sup>1</sup> G. Shiva Shanker<sup>1</sup>

<sup>1</sup>Chemistry, Indian Institute of Science Education and Research (IISER) Pune, Pune, India

O03

### Cation doping of PbS quantum dots with a range of elements and the exceptional case of bismuth as a dopant for achieving air-stable homojunction solar cells

Alexandros Stavrinadis<sup>1,\*</sup> Gerasimos Konstantatos<sup>1</sup>

<sup>1</sup>ICFO- Institut de Ciències Fotòniques, Castelldefels (Barcelona), Spain

O04

### Patterning of Nanocrystal films by Inhibiting Cation Exchange via Electron-Beam or X-ray Lithography

Roman Krahne<sup>1,\*</sup> Karol Miszta<sup>1</sup> Fanny Greullet<sup>1</sup> Sergio Marras<sup>1</sup> Mirko Prato<sup>1</sup> Andrea Toma<sup>1</sup> Milena Accriniégas<sup>1</sup> Liberato Manna<sup>1</sup>

<sup>1</sup>Fondazione Istituto Italiano di Tecnologia, Genova, Italy

27 May 2014

Contributed Talks Session 2

11:20 – 12:40

Jussieu Amphitheatre

O05

### Optical properties of I-VII compound nanocrystals

Pierre Gilliot<sup>1,\*</sup> Bernd Hönerlage<sup>2</sup>

<sup>1</sup>IPCMS, CNRS, <sup>2</sup>IPCMS, university of Strasbourg, STRASBOURG CEDEX, France

O06

### Entropy-driven Formation of Large Icosahedral Colloidal Clusters by Spherical Confinement

Alfons van Blaaderen<sup>1,\*</sup> Bart de Nijs<sup>1</sup> Simone Dussi<sup>1</sup> Frank Smalenburg<sup>1</sup> Laura Filion<sup>1</sup> Arnout Imhof<sup>1</sup> Marjolein Dijkstra<sup>1</sup>

<sup>1</sup>Physics, Debye Institute, Utrecht University, Utrecht, Netherlands

O07

### Control of Exciton Transport in Quantum Dot Thin Films

Ferry Prins<sup>1,\*</sup> Gleb M Akselrod<sup>2</sup> Lisa V Poulidakos<sup>1</sup> Elisabeth M.Y. Lee<sup>1</sup> Mark C Weidman<sup>1</sup> Jolene Mork<sup>3</sup> Adam P Willard<sup>3</sup> Vladimir Bulovic<sup>4</sup> William A Tisdale<sup>1</sup>

<sup>1</sup>Department of Chemical Engineering, <sup>2</sup>Department of Physics, <sup>3</sup>Department of Chemistry, <sup>4</sup>Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, United States

**27 May 2014**

**Contributed Talks Session 3**

**16:00 – 17:20**

**Jussieu Amphitheatre**

O08

**Effect of dangling bonds on low temperature photoluminescence in CdSe nanocrystals**

Anna Rodina<sup>1,\*</sup>, Alexander L. Efros<sup>2</sup>

<sup>1</sup>Ioffe Physical Technical Institute, St. Petersburg, Russian Federation, <sup>2</sup>Naval Research Laboratory, Washington, United States

O09

**Controlling the charge and energy transfer of QD assemblies for the efficient QD-LED and display**

Kyung-Sang Cho<sup>1,\*</sup>, Tae-Ho Kim<sup>1</sup>, Dae Young Chung<sup>1</sup>, JiYeon Ku<sup>1</sup>, Byoung Lyong Choi<sup>1</sup>, Sungwoo Hwang<sup>1</sup>

<sup>1</sup>Nano Electronics Lab, SAIT(Samsung Advance Institute of Technology), Yongin-si, Korea, Republic Of

O10

**Quantification of Trap States in Colloidal Nanocrystal Solids and their Influence on Solar Cell Performance**

Deniz Bozyigit<sup>1</sup>, Olesya Yarema<sup>1</sup>, Sebastian Volk<sup>1</sup>, Weyde Lin<sup>1</sup>, Vanessa Wood<sup>1,\*</sup>

<sup>1</sup>ETH Zurich, Zurich, Switzerland

O11

**Imaging and manipulating single cellular events in living cells with functionalized nanoparticles**

Chiara Vicario<sup>1,\*</sup>, Fred Etoc<sup>1</sup>, Domenik Lisse<sup>1</sup>, Mathieu Coppey<sup>1</sup>, Maxime Dahan<sup>1</sup>

<sup>1</sup>Physico-chimie Curie UMR168, Institut Curie, Paris, France

O12

**Multiplexed Biosensors Using Quantum Dot-Based Time-Resolved Förster Resonance Energy Transfer (FRET)**

K. David Wegner<sup>1</sup>, Xue Qiu<sup>1</sup>, Stina Lindén<sup>1</sup>, Zongwen Jin<sup>1</sup>, W. Russ Algar<sup>2</sup>, Igor L. Medintz<sup>3</sup>, Niko Hildebrandt<sup>1,\*</sup>

<sup>1</sup>Université Paris-Sud, Orsay, France, <sup>2</sup>University of British Columbia, Vancouver, Canada, <sup>3</sup>U.S. Naval Research Laboratory, Washington D.C., United States

**28 May 2014**

**Contributed Talks Session 4**

**15:30 – 17:10**

**Jussieu Amphitheatre**

O13

**Excitonic properties of II-VI semiconductor colloidal nanoplatelets**

Paul Voisin<sup>1,\*</sup>, Jacky Even<sup>2</sup>, Nikolay A. Gippius<sup>3</sup>, Ramzi Benchamekh<sup>1</sup>, Mikhail O. Nestoklon<sup>4</sup>, Laurent Pedesseau<sup>2</sup>, Jean-Marc Jancu<sup>2</sup>, Benoît Dubertret<sup>5</sup>, Alexandre L. Efros<sup>6</sup>

<sup>1</sup>LPN, CNRS, Marcoussis, <sup>2</sup>FOTON, INSA-Rennes et CNRS, Rennes, France, <sup>3</sup>A.M. Prokorov General Physics Institute, RAS, Moscow, <sup>4</sup>A.F. Ioffe Institute, RAS, St Petersburg, Russian Federation, <sup>5</sup>LPEM, ESPCI et CNRS, Paris, France, <sup>6</sup>Naval Research Laboratory, Washington, United States

O14

**Electrochemical Control over Charge Transfer and Trapping in CdSe-CdTe QD Solids**

Arjan Houtepen<sup>1,\*</sup>, Simon Boehme<sup>1</sup>, Ardaan Walvis<sup>1</sup>, Daniel Vanmaekelbergh<sup>2</sup>, Laurens Siebbeles<sup>1</sup>

<sup>1</sup>Chemical Engineering, Delft University of Technology, Delft, <sup>2</sup>Condensed Matter and Interfaces, Utrecht University, Utrecht, Netherlands

O15

**Novel strategies to improve the conduction properties of colloidal quantum dot solids**

Emmanuel Lhuillier<sup>1,\*</sup>, Benoit Dubretret<sup>2</sup>

<sup>1</sup>solarwell, <sup>2</sup>LPEM, ESPCI, Paris, France

O16

**Near-Thresholdless Optical Gain using Colloidal HgTe Quantum Dots**

Pieter Geiregat<sup>1,\*</sup> Arjan J. Houtepen<sup>2</sup> Laxmi Kishore Sagar<sup>3</sup> Christophe Delerue<sup>4</sup> Ferdinand C. Grozema<sup>2</sup> Guy Allan<sup>4</sup> Dries Van Thourhout<sup>1</sup> Zeger Hens<sup>3</sup>

<sup>1</sup>Information Technology, University of Ghent, Gent, Belgium, <sup>2</sup>Chemistry, Delft University of Technology, Delft, Netherlands, <sup>3</sup>Inorganic and Physical Chemistry, University of Ghent, Gent, Belgium, <sup>4</sup>ISEN, Université de Lille, Lille, France

O17

**Spin dynamics of negative trions in ensemble of colloidal CdSe/CdS core/shell nanocrystals**

Dmitri R. Yakovlev<sup>1,\*</sup> Feng Liu<sup>2</sup> Anna V. Rodina<sup>3</sup> Loius Biadala<sup>2</sup> Daniel Dunker<sup>2</sup> Clementine Javaux<sup>4</sup> Jean-Pierre Hermier<sup>5</sup> Alexander L. Efros<sup>6</sup> Benoit Dubertret<sup>4</sup> Manfred Bayer<sup>2</sup>

<sup>1</sup>TU Dortmund University, Dortmund, Germany, <sup>2</sup>Experimental Physics 2, TU Dortmund University, Dortmund, Germany, <sup>3</sup>Ioffe Physical-Technical Institut, Russian Academy of Sciences, St. Petersburg, Russian Federation, <sup>4</sup>Laboratoire de Physique et d'Etude des Matériaux, CNRS, Paris, <sup>5</sup>Université de Versailles-Saint-Quentin-en-Yvelines, Versailles, France, <sup>6</sup>Naval Research Laboratory, Washington, United States

## POSTERS

**May 26-27 2014**  
**Poster Session 1**

[Applications of quantum dots in lasers, light-emitting diodes, displays, memory, photo-detectors, solar cells, etc...](#)

P001

**Improved performance and stability in quantum dot solar cells through band alignment engineering**

Chia-Hao M Chuang<sup>1,\*</sup> Patrick R Brown<sup>2</sup> Vladimir Bulovic<sup>3</sup> Mounqi G Bawendi<sup>4</sup>

<sup>1</sup>Materials Science and Engineering, <sup>2</sup>Physics, <sup>3</sup>Electrical Engineering and Computer Science, <sup>4</sup>Chemistry, Massachusetts Institute of Technology, Cambridge, United States

P002

**Synthesis of CuInTe<sub>2</sub>-xSex and photovoltaic application**

Joong Pill Park<sup>1,\*</sup> Sang Wook Kim<sup>1</sup>

<sup>1</sup>ajou university, suwon, Korea, Republic Of

P003

**Heavy-Metal-Free Quantum Dot-Sensitized Solar Cells Employing Band Energy Engineered Copper-Indium-Selenide Quantum Dots**

Jiwoong Yang<sup>1,2,\*</sup> Taeghwan Hyeon<sup>1,2</sup>

<sup>1</sup>School of Chemical and Biological Engineering, Seoul National University, <sup>2</sup>Center for Nanoparticle Research, Institute for Basic Science, Seoul, Korea, Republic Of

P005

**Unravelling the role of Auger recombination in the performance of light-emitting diodes based on nano-engineered colloidal quantum dots**

Jeffrey M. Pietryga<sup>1,\*</sup> Wan Ki Bae<sup>2</sup> Young-Shin Park<sup>1</sup> Jaehoon Lim<sup>1</sup> Lazaro A. Padilha<sup>3</sup> Victor I. Klimov<sup>1</sup>

<sup>1</sup>Chemistry Division, Los Alamos National Laboratory, Los Alamos, United States, <sup>2</sup>Photo-Electronic Hybrid Research Center, Korea Institute of Science and Technology, Seoul, Korea, Republic Of, <sup>3</sup>Instituto de Física "Gleb Wataghin", Universidade Estadual de Campinas, Campinas, Brazil

P006

**All 2D graphene-metal chalcogenides hybrid photodetector**

Adrien Robin<sup>1,2,\*</sup> Emmanuel Lhuillier<sup>2</sup> Emiliano Pallecchi<sup>3,4</sup> Abdelkarim Ouerghi<sup>4</sup> Benoit Dubertret<sup>1</sup>

<sup>1</sup>LPEM, CNRS - ESPCI ParisTech, <sup>2</sup>Nexdot, PARIS, <sup>3</sup>IEMN, Université de Lille, Lille, <sup>4</sup>LPN, CNRS, Marcoussis, France

P007

**Quantum Dot Based Luminescent Solar Concentrators with Reduced Reabsorption**

Igor Coropceanu<sup>1,\*</sup>, Mounqi G. Bawendi<sup>1</sup>

<sup>1</sup>Department of Chemistry, Massachusetts Institute of Technology, Cambridge, United States

P008

**LED application of highly photoluminescent silica hybrid nanostructure containing assembled QD layer**

Kyoungja Woo<sup>1,\*</sup>, Hyein Yoo<sup>1,2</sup>, Kwangyeol Lee<sup>2</sup>

<sup>1</sup>Molecular Recognition Research Center, Korea Institute of Science and Technology, <sup>2</sup>Department of Chemistry, Korea University, Seoul, Korea, Republic Of

P009

**Scalable preparation and photovoltaic application of quantum dots**

Xinhua Zhong<sup>1,\*</sup>

<sup>1</sup>East China University of Science and Technology, Shanghai, China

P010

**Plasmonic hybrid nanosystems for solar water splitting**

Alina Chanaewa<sup>1,\*</sup>, Julius Schmitt<sup>1</sup>, Michaela Meyns<sup>2</sup>, Chrisitan Klinke<sup>2</sup>, Elizabeth von Hauff<sup>1</sup>

<sup>1</sup>University of Freiburg / Fraunhofer ISE, Freiburg, <sup>2</sup>University of Hamburg, Hamburg, Germany

P011

**Synthesis and optimization of colloidal quantum dots for thin film transistor (TFT) applications**

Uladzimir Sayevich<sup>1,\*</sup>, Nikolai Gaponik<sup>1</sup>, Alexander Eychmüller<sup>1</sup>

<sup>1</sup>Physical Chemistry, Technische Universität Dresden, Dresden, Germany

P012

**Using colloidal quantum dots to boost photovoltaic cell performance**

Miri Kazes<sup>1,\*</sup>, Sophia Buhbut<sup>2</sup>, Arie Zaban<sup>2</sup>, Dan Oron<sup>1</sup>

<sup>1</sup>Physics of Complex Systems, Weizmann Institute of Science, Rehovot, <sup>2</sup>Department of Chemistry, Bar Ilan University, Ramat Gan, Israel

P013

**Low turn-on voltage Near Infrared LEDs based on core-shell PbS/CdS quantum dots with inverted device structure**

Rafael Sánchez Sánchez<sup>1,\*</sup>, Enrico Binetti<sup>2</sup>, Jose Angel de la Torre<sup>1</sup>, Germà García Belmonte<sup>1</sup>, Marinella Striccoli<sup>3</sup>, Iván Mora Seró<sup>1</sup> and Photovoltaic and Optoelectronic Devices Group (GDFO)

<sup>1</sup>Photovoltaic and Optoelectronic Devices Group, Universitat Jaume I, Castellón de la Plana, Spain, <sup>2</sup>Institute for Composite and Biomedical Materials, <sup>3</sup>Department of Chemistry, CNR-IPCF Division of Bari, Bari, Italy

P014

**Molecular-level control of polymer/nanocrystal interface towards efficient hybrid solar cells**

Carlo Giansante<sup>1,\*</sup>, Rosanna Mastria<sup>2</sup>, Giovanni Lerario<sup>1</sup>, Aurora Rizzo<sup>2</sup>, Giuseppe Gigli<sup>3</sup>

<sup>1</sup>Italian Institute of Technology, <sup>2</sup>Nanoscience Institute - CNR, <sup>3</sup>University of Salento, Lecce, Italy

P015

**Energy level modification in lead sulfide quantum dot thin films through ligand exchange**

Patrick R. Brown<sup>1,\*</sup>, Donghun Kim<sup>2</sup>, Richard R. Lunt<sup>3</sup>, Ni Zhao<sup>4</sup>, Jeffrey C. Grossman<sup>2</sup>, Mounqi G. Bawendi<sup>5</sup>, Vladimir Bulovic<sup>6</sup>

<sup>1</sup>Physics, <sup>2</sup>Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, <sup>3</sup>Chemical Engineering and Materials Science, Michigan State University, East Lansing, United States, <sup>4</sup>Electronic Engineering, Chinese University of Hong Kong, Hong Kong, Hong Kong, <sup>5</sup>Chemistry, <sup>6</sup>Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, United States

P016

**Colloidal Quantum Dot-based Red, Green, Blue, and Natural White Light Thin Flexible Low-voltage Driven Light-Emitting Devices**

Seonghoon Lee <sup>1,\*</sup>

<sup>1</sup>Chemistry, Seoul National University, Seoul, Republic of Korea

P017

**Large area luminescent solar concentrators based on “Stokes-shift-engineered” nanocrystals in mass polymerized polymethylmethacrylate matrix**

Francesco Meinardi <sup>1</sup>Annalisa Colombo <sup>1</sup>Monica Lorenzon <sup>1</sup>Kirill Velizhanin <sup>2</sup>Roberto Simonutti <sup>1</sup>Ranjani Viswanatha <sup>3</sup>Luca Beverina <sup>1</sup>Victor Klimov <sup>2</sup>Sergio Brovelli <sup>1,\*</sup>

<sup>1</sup>Department of Materials Science, University of Milano Bicocca, Milano, Italy, <sup>2</sup>Los Alamos National Laboratory, Los Alamos, United States, <sup>3</sup>New Chemistry Unit and International Centre for Materials Science, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India

P018

**Solar Photochemical Fuel Generation using Semiconductor Nanocrystals**

Gordana Dukovic <sup>1,\*</sup>

<sup>1</sup>Department of Chemistry and Biochemistry, University of Colorado Boulder, Boulder, United States

**Charge transport through nanocrystals and assemblies of nanocrystals**

P020

**Tuning the Absorption Spectra and Conductivity Properties of Cu<sub>2</sub>-xS Nanocrystal films for Solar Harvesting Application**

Lige Liu <sup>1,2</sup>Bin Zhou <sup>3</sup>Luogen Deng <sup>2</sup>Bingsuo Zou <sup>2</sup>Wenhua Zhang <sup>3</sup>Haizheng Zhong <sup>1,\*</sup>

<sup>1</sup>School of Materials Science & Engineering, <sup>2</sup>School of Physics, Beijing Institute of Technology, Beijing, <sup>3</sup>Dalian Institute of Chemical Physics, Dalian, China

P021

**Sub-100nm Molecular nanoparticles network as a platform for nanoelectronics with enhanced properties**

Jean-Francois Dayen <sup>1,\*</sup>Edwin Devid <sup>2</sup>Mutta Venkata Kamalakar <sup>1</sup>Matthias Pauly <sup>1</sup>Vina Faramarzi <sup>1</sup>Benoit Pichon <sup>1</sup>Dmitry Golubev <sup>3</sup>Silvie Begin Colin <sup>1</sup>Bernard Doudin <sup>1</sup>Sense jan Van der Molen <sup>2</sup>

<sup>1</sup>Institute of Physics and Chemistry of Materials of Strasbourg (CNRS-Strasbourg University), Strasbourg, France, <sup>2</sup>Kamerlingh Onnes Laboratory Leiden University, Leiden, Netherlands, <sup>3</sup> Institut für Theoretische Festkörperphysik Karlsruher Institut für Technologie (Universität), Karlsruhe, Germany

P022

**Study of electron-phonon coupling in nanoparticles through tunnelling spectroscopy**

Herve Aubin <sup>1,\*</sup>Hongyue Wang <sup>1</sup>Qian Yu <sup>1</sup>Emmanuel Lhuillier <sup>1</sup>Christian Ulysse <sup>2</sup>Valentina rebuttini <sup>3</sup>Alexandre Zimmers

<sup>1</sup>Alireza mottaghizadeh <sup>1</sup>Benoit Dubertret <sup>1</sup>Nicola Pinna <sup>3</sup>

<sup>1</sup>ipem, CNRS-ESPCI, Paris, <sup>2</sup>LPN, CNRS, Marcoussis, France, <sup>3</sup>Humboldt University, Berlin, Germany

P024

**Integrated Nanocrystal Quantum Dot - Semiconductor Systems: Atomic Structure and Time-Resolved Photoluminescence Behavior**

Anupam Madhukar <sup>1,\*</sup>Siyuan Lu <sup>1</sup>Zachary Lingley <sup>1</sup>

<sup>1</sup>University of Southern California, Los Angeles, United States

P025

**Telegraph Noise in Transport through Colloidal Quantum Dots**

Claudine Ni. Allen <sup>1,\*</sup>Dany Lachance-Quirion <sup>1,2</sup>Samuel Tremblay <sup>1</sup>Sébastien A. Lamarre <sup>1</sup>Vincent Méthot <sup>1</sup>Daniel Gingras

<sup>1</sup>Julien Camirand Lemyre <sup>2</sup>Michel Pioro-Ladrière <sup>2</sup>

<sup>1</sup>Centre d'optique, photonique et laser (COPL), Université Laval, Québec, <sup>2</sup>Département de physique, Université de Sherbrooke, Sherbrooke, Canada

P026

**Polaron state and transport properties of the surface electrons in Q0D electron system**

Oleksandr Smorodin <sup>1,\*</sup>

<sup>1</sup>B.Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine, Kharkov, Ukraine

P027

**Electrical Transport Studies of Semiconductor Nanocrystals via AC Hall, CELIV, and TOF Measurements**

E. Ashley Gauding,<sup>1,\*</sup> Zachary T. Vrtis,<sup>1</sup> Julia L. Fordham,<sup>1</sup> Benjamin T. Diroll,<sup>2</sup> Jérôme Faure-Vincent,<sup>3,4,5</sup> Peter Reiss,<sup>3,4,5</sup> Cherie Kagan,<sup>1,2,6</sup> Christopher B. Murray<sup>1,2</sup>

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<sup>2</sup>Department of Chemistry, University of Pennsylvania, Philadelphia, PA 19104, USA, <sup>3</sup>Univ. Grenoble Alpes, INAC-SPRAM, F-38000 Grenoble, France, <sup>4</sup>CNRS, INAC-SPRAM, F-38000 Grenoble, France, <sup>5</sup>CEA, INAC-SPRAM, F-38000 Grenoble, France, <sup>6</sup>Department of Electrical and Systems Engineering, University of Pennsylvania, Philadelphia, PA 19104, USA

Fabrication and characterization of nano crystals, nanocrystal assemblies, and hybrid structures

P028

**Coupled exciton-plasmon state in colloidal nanoparticle combinations**

Holger Lange<sup>1,\*</sup> Horst Weller<sup>1</sup> Andreas Knorr<sup>2</sup> Christian Schmidtke<sup>1</sup> Sverre Theuerholz<sup>2</sup>

<sup>1</sup>Institut fuer Physikalische Chemie, Universitaet Hamburg, Hamburg, <sup>2</sup>Institut fuer Theoretische Physik, Technische Universitaet Berlin, Berlin, Germany

P029

**Precise location and concentration of dopant insertion inside colloidal quantum dots: synthesis strategy and optical properties**

Nathan Grumbach<sup>1,\*</sup> Anna Rubin-Brusilovski<sup>1</sup> Georgy Maikov<sup>1</sup> Evgeniy Tilchin<sup>1</sup> Efrat Lifshitz<sup>1</sup>

<sup>1</sup>Technion - Israel Institute of Technology, Haifa, Israel

P030

**Engineering of the Electronic Structure of Type-II Core/Shell Quantum Dots by in-situ Alloying**

Klaus Boldt<sup>1,\*</sup> Nicholas Kirkwood<sup>1</sup> Paul Mulvaney<sup>1</sup>

<sup>1</sup>School of Chemistry & Bio21 Institute, University of Melbourne, Parkville, Australia

P031

**Ultrathin Size- and Shape-Controlled Colloidal Cu<sub>2</sub>-xS 2D Nanosheets**

Ward Van Der Stam<sup>1,\*</sup> Quinten Akkerman<sup>1</sup> Xiaoxing Ke<sup>2</sup> Sara Bals<sup>2</sup> Celso de Mello Donegá<sup>1</sup>

<sup>1</sup>Debye Institute, Utrecht University, Utrecht University, Utrecht, Netherlands, <sup>2</sup>EMAT, University of Antwerp, Antwerp, Belgium

P032

**Highly luminescent CuGaxIn<sub>1-x</sub>SySe<sub>2-y</sub> nanocrystals from organometallic single-source precursors**

Taleb Mokari<sup>1,\*</sup>

<sup>1</sup>Chemistry, Ben-Gurion University of the Negev, Beer-sheva, Israel

P033

**Synthesis, structure and optical properties of II-VI colloidal heteronanoplatelets**

Artsiom Antanovich<sup>1</sup> Anatol Prudnikau<sup>1</sup> Mikhail Artemyev<sup>1,\*</sup>

<sup>1</sup>Institute for Physico-Chemical Problems, Belarusian State University, Minsk, Belarus

P034

**Complex nano-particle self-assembly directed by molecular entities**

Simon Tricard<sup>1,\*</sup> Bruno Chaudret<sup>1</sup>

<sup>1</sup>LPCNO, INSA, CNRS, Université de Toulouse, Toulouse, France

P035

**Relationship between Au nanoparticle morphology and 2 D & 3 D superstructures**

Danny Haubold<sup>1,\*</sup> Lydia Bahrig<sup>1</sup> Paul Simon<sup>2</sup> Stephen G. Hickey<sup>1</sup> Alexander Eychmüller<sup>1</sup>

<sup>1</sup>Technische Universität Dresden, <sup>2</sup>Max Planck Institute for Chemical Physics of Solids, Dresden, Germany

P036

**Atomic-resolution imaging and chemical mapping of anisotropic cation exchange in CdSe/PbSe quantum dot nanostructures**

Marijn Van Huis<sup>1,\*</sup>, Marianna Casavola<sup>1</sup>, Bart Goris<sup>2</sup>, Anil O Yalcin<sup>3</sup>, Frans D Tichelaar<sup>3</sup>, Henny W Zandbergen<sup>3</sup>, Alfons van Blaaderen<sup>1</sup>, Sara Bals<sup>2</sup>, Daniel Vanmaekelbergh<sup>1</sup>

<sup>1</sup>Debye Institute for Nanomaterials Science, Utrecht University, Utrecht, Netherlands, <sup>2</sup>EMAT, University of Antwerp, Antwerp, Belgium, <sup>3</sup>Kavli Institute of Nanoscience, Delft University of Technology, Delft, Netherlands

P037

**The Chemistry of the Nanocrystal Surface: A Missing Link for a Mechanistic Interpretation of Cationic Exchange Reactions**

Yolanda Justo<sup>1,\*</sup>, Chiluka Laxmi Kishore Sagar<sup>1</sup>, Zeger Hens<sup>1</sup>

<sup>1</sup>Inorganic and Physical Chemistry, University of Ghent, Ghent, Belgium

P038

**Fabrication of superparamagnetic hybrid structure containing assembled QD layer for on-site biosensor**

Kyoungja Woo<sup>1,\*</sup>, Wooyoung Park<sup>1</sup>, Sang Kyung Kim<sup>2</sup>

<sup>1</sup>Molecular Recognition Research Center, <sup>2</sup>Center for BioMicrosystems, Korea Institute of Science and Technology, Seoul, Korea, Republic Of

P039

**Study of colloidal Quantum Dots heterostructures by aberration-corrected Scanning Transmission Electron Microscopy**

Gilles Patriarche<sup>1,\*</sup>, Silvia Pedetti<sup>2</sup>, Michel Nasilowski<sup>2</sup>, Mickael D. Tessier<sup>2</sup>, Cécile Bouet<sup>2</sup>, Benoit Mahler<sup>2</sup>, Benoit Dubertret<sup>2</sup>

<sup>1</sup>Laboratoire de Photonique et de Nanostructures, CNRS, Marcoussis, <sup>2</sup>Laboratoire de Physique et d'Etude des Matériaux, ESPCI, Paris, France

P040

**One-pot low temperature synthesis of wurtzite ZnS nanoplatelets**

Aude Buffard<sup>1,\*</sup>, Brice Nadal<sup>2</sup>, Hadrien Heuclin<sup>2</sup>, Benoit Dubertret<sup>3</sup>

<sup>1</sup>LPEM, ESPCI, <sup>2</sup>Nexdot, <sup>3</sup>LPEM, CNRS, ESPCI, Paris, France

P041

**One step synthesis of silicon nanocrystals with ultra narrow linewidth**

Anna Fucikova<sup>1,\*</sup>, Ilya Sychugov<sup>1</sup>, Jan Linnros<sup>1</sup>, Fatemeh Sangghaleh<sup>2</sup>, Federico Peverè<sup>1</sup>

<sup>1</sup>School of ICT, MF MATERIALFYSIK, KTH Royal Institute of Technology, Kista, <sup>2</sup>KTH Royal Institute of Technology, KISTA, Sweden

P042

**Interfacing Quantum Dots and Graphitic Surfaces with Chloride Anions as Ligands**

Beatriz H. Juarez<sup>1,\*</sup>, Fabiola Iacono<sup>2</sup>, Cristina Palencia<sup>2</sup>, Leonor de la Cueva<sup>2</sup>, Concepcion Alonso<sup>3</sup>, Jose M. Gallego<sup>4</sup>, Roberto Otero<sup>5</sup>, Koen Lauwaet<sup>2</sup>

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P043

**Phase transfer of CTAB stabilized gold nanorods into organic phase**

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P045

**Kinetics of semiconductor nanocrystals growth in non-injection synthesis observed in-situ**

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P046

**Non-Injection Synthesis of  $\text{Cu}_2\text{ZnSnS}_4$  and  $\text{Cu}_2\text{ZnGeS}_4$  Nanocrystals Through a Binary Precursor Approach**

Jacek Jasieniak<sup>1,\*</sup>, Anthony Chesman<sup>1</sup>

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P047

**Enhanced stability of lead chalcogenide colloidal quantum dots via surface control**

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P048

**Structural and optoelectronic stabilisation of PbSe nanocrystals through surface modification**

Demet Asil<sup>1</sup>, Brian J Walker<sup>1,\*</sup>, Bruno Ehrler<sup>1</sup>, Yana Vaynzof<sup>1,2</sup>, Alessandro Sepe<sup>1</sup>, Sam Bayliss<sup>1</sup>, Aditya Sadhanala<sup>1</sup>, Philip Chow<sup>1</sup>, Paul Hopkinson<sup>1,2</sup>, Ulli Steiner<sup>1</sup>, Neil C Greenham<sup>1</sup>, Richard H Friend<sup>1</sup>

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P049

**Using Cation Exchange Reactions to Obtain Unique, Highly Fluorescent Semiconductor Nanocrystals**

Hongbo Li<sup>1</sup>, Rosaria Brescia<sup>1</sup>, Mirko Prato<sup>1</sup>, Giovanni Bertoni<sup>1</sup>, Liberato Manna<sup>1</sup>, Iwan Moreels<sup>1,\*</sup>

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P050

**Phonon spectra of CdSe and CdSe/CdS nanoplatelets probed by Raman and IR spectroscopies**

Volodymyr Dzhagan<sup>1,\*</sup>, Alexander Milekhin<sup>2</sup>, Mykhailo Valakh<sup>3</sup>, Hadrien Heuclin<sup>4</sup>, Silvia Pedetti<sup>4</sup>, Benoit Dubertret<sup>4</sup>, Dietrich Zahn<sup>1</sup>

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P051

**Band-gap engineering of core/shell and core/crown nanoplatelets: synthesis and optical properties.**

Silvia Pedetti<sup>1,\*</sup>, Sandrine Ithurria<sup>1</sup>, Hadrien Heuclin<sup>1</sup>, Emmanuel Lhuillier<sup>1</sup>, Piernicola Spinicelli<sup>1</sup>, Gilles Patriarche<sup>2</sup>, Benoit Dubertret<sup>1</sup>

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P052

**Colloidal quantum dots: the mechanism of precursor conversions at low temperature with the presence a primary amine**

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**Photonic structures and nanocrystals**

P053

**The optical Bloch oscillation in the CdS nanowire periodically doped by  $\text{SnS}_2$  QDs**

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P054

**Photonic effects on the energy transfer efficiency in doped nanocrystals**

Freddy Rabouw<sup>1,\*</sup>, Stephan den Hartog<sup>1</sup>, Tim Senden<sup>1</sup>, Andries Meijerink<sup>1</sup>

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P055

**Water-soluble CdTe/CdS semiconductor colloidal nanocrystals as resonators inside a  $\text{Si}_3\text{N}_4$ -based photonic crystal microcavity**



Carlos Gabriel Pankiewicz<sup>1,\*</sup> Paulo Sérgio Soares Guimarães<sup>1</sup> Dario Gerace<sup>2</sup> Tiziana Stomeo<sup>3,4</sup> Antonio Quattieri<sup>3</sup>  
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P056

**Vertically slotted ring resonators coupled to colloidal PbS nanocrystals for Si based telecom applications**

Markus Humer<sup>1</sup> Romain Guider<sup>2</sup> Florian Hackl<sup>1</sup> Thomas Fromherz<sup>1,\*</sup>

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[Theory in quantum dots](#)

P057

**Anomalous photoluminescence temperature dependence in quantum dots systems**

Karel Kral<sup>1,\*</sup>

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P058

**Theory of the quantum Hall transport in the quantum dot ensembles**

Andrey Greshnov<sup>1,\*</sup> Yaroslav Beltukov<sup>1</sup>

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P059

**Silicon nanostructures for third-generation solar cells: carrier multiplication effects**

Stefano Ossicini<sup>1,\*</sup> Marri Ivan<sup>1</sup> Marco Govoni<sup>1</sup>

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P060

**Decoherence dynamics and Telegraph noise effects on two charge-qubits in double self-assembled quantum dots**

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<sup>1</sup>Physique, <sup>2</sup>Faculte des sciences de bizerte, Bizerte, Tunisia

P061

**A new type of intraband absorption spectroscopy based on the shape-induced optical anisotropy of a semiconductor nanocrystal**

Anvar S. Baimuratov<sup>1</sup> Ivan D. Rukhlenko<sup>1,2</sup> Vadim K. Turkov<sup>1</sup> Mikhail Yu. Leonov<sup>1</sup> Alexander V. Baranov<sup>1</sup> Yurii K. Gun'ko<sup>1</sup>  
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P062

**DFT modeling of CdSe bulk crystals and stabilized nanoplatelets of various thicknesses**

Alexandra Szemjonov<sup>1,\*</sup> Frédéric Labat<sup>1</sup> Ilaria Ciofini<sup>1</sup> Sandrine Ithurria<sup>2</sup> Nicolas Lequeux<sup>2</sup> Benoit Dubertret<sup>2</sup> Thierry Pauporté<sup>1</sup>

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P063

**Simulation of real size quantum dots: an ab initio approach**

Ronaldo Rodrigues Pela<sup>1,\*</sup> Marcelo Marques<sup>1</sup> Luiz Guimaraes Ferreira<sup>2</sup> Lara Kuhl Teles<sup>1</sup>

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**May 27-28 2014**  
**Poster Session 2**

Nanocrystals for Biological and Medical Applications

P064

**Time resolved sensing with QDs**

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P065

**Physical reasons of emission transformation in CdSeTe/ZnS quantum dots at the bioconjugation to antibodies**

Tetyana V. Torchynska<sup>1,\*</sup>

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P066

**Short-wavelength infra red (SWIR) emitting quantum dots for non-invasive in vivo and high speed intravital imaging of fast physiological processes**

Oliver Bruns<sup>1,\*</sup> Thomas Bischof<sup>1</sup> Daniel Harris<sup>1</sup> Mounji Bawendi<sup>1</sup> and Bawendi group

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P067

**Terbium to quantum dot FRET-based nanobody-immunoassays for in-vitro diagnostics of epidermal growth factor receptors**

Xue Qiu<sup>1,\*</sup> K.David Wegner<sup>1</sup> Niko Hildebrandt<sup>1</sup>

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P068

**Conjugated quantum dots as fluorescent tags for targeted bio-imaging applications**

Akram Yahia Ammar<sup>1,\*</sup> Aline Nonat<sup>1</sup> Amandine Roux<sup>1</sup> David Wegner<sup>2</sup> Niko Hildebrandt<sup>2</sup> Loïc Charbonnière<sup>1</sup>

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P069

**Quantum dot – antibody conjugates for FRET immunoassays**

Lucia Mattera,<sup>1,2,3,\*</sup> Tim Senden,<sup>1,2,3</sup> David Wegner,<sup>4</sup> Peter Reiss<sup>1,2,3</sup>

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P070

**Cadmium free multimodal quantum dot probes for in vivo magnetic resonance and near infrared fluorescence imaging**

Gary Sitbon<sup>1,\*</sup> Sophie Bouccara<sup>2</sup> Aurélie François<sup>3</sup> Lina Bezdetnaya<sup>3</sup> Frédéric Marchal<sup>3</sup> Marine Beaumont<sup>4</sup> Thomas Pons<sup>2</sup>

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P071

**High-Resolution Three Photon Fluorescence Microscope Imaging with Biocompatible Mn<sup>2+</sup>:ZnS Nanocrystals**

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P072

**Multicolor colloidal quantum dots for FRET-based multiplexed detection of cancer biomarkers**

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P073

**Near infrared biocompatible quantum dots for time-gated imaging and in vivo cells tracking**

Sophie Bouccara<sup>1,\*</sup> Alexandra Fragola<sup>1</sup> Emerson Giovanelli<sup>1</sup> Gary Sitbon<sup>1</sup> Nicolas Lequeux<sup>1</sup> Thomas Pons<sup>1</sup> Vincent Lorientte<sup>1</sup>  
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P074

**Multidentate polyzwitterionic ligands for long-term bioimaging based on highly stable and functionalized quantum dots**

Emerson Giovanelli<sup>1,\*</sup> Eleonora Muro<sup>1</sup> Mariana Tasso<sup>1</sup> Gary Sitbon<sup>1</sup> Mohamed Hanafi<sup>2</sup> Thomas Pons<sup>1</sup> Benoît Dubertret<sup>1</sup> Nicolas Lequeux<sup>1</sup>  
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P076

**Biofunctional quantum dots as specific cell markers for diagnostics and cell identification**

Mariana Tasso<sup>1,\*</sup> Emerson Giovannelli<sup>1</sup> Nicolas Lequeux<sup>1</sup> Alexandra Fragola<sup>1</sup> Thomas Pons<sup>1</sup>  
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P077

**Developing QD-DNA bioconjugates for biological applications**

Anusuya Banerjee<sup>1,\*</sup> Chloe Grazon<sup>1</sup> Yamuna Krishnan<sup>2</sup> Benoit Dubertret<sup>1</sup>  
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P078

**Paramagnetic, near-infrared colloidal semiconductor nanoparticles**

Lyudmila Turyanska<sup>1,\*</sup> Fabrizio Moro<sup>1</sup> Amalia Patane<sup>1</sup> Michael W Fay<sup>2</sup> Tracey D Bradshaw<sup>3</sup> Rebecca Trueman<sup>4</sup> Peter Wigmore<sup>4</sup> Phil Clarke<sup>4</sup> Henryk Faas<sup>4</sup> Anna M Grabowska<sup>4</sup> Neil R Thomas<sup>5</sup>  
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P079

**Water Soluble Quantum Dots (CdSe/ZnS) for Optical Imaging**

Siti Fatimah Abdul Ghani<sup>1,\*</sup> Maya Thanou<sup>1</sup> Melanie Bottrill<sup>2</sup> Juan Gallo Paramo<sup>3</sup> Nick Long<sup>3</sup> Michael Wright<sup>1</sup>  
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P080

**Quantum dot-core silica glass shell capsules by using alkoxide molecules as surface ligands for biomedical applications**

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**[Optical properties of nanocrystals](#)**

P081

**Temperature-controlled size dependence of photoluminescence decay time in PbS quantum dots**

Alexander Baranov<sup>1,\*</sup> Elena Ushakova<sup>1</sup> Aleksandr Litvin<sup>1</sup> Anatoly Fedorov<sup>1</sup>  
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P083

**Exploring the structure and the influence of the ligand shell on the emission properties of water-soluble CdTe and CdHgTe quantum dots**

Susanne Leubner<sup>1,\*</sup> Soheil Hatami<sup>2</sup> Tommy Lorenz<sup>1</sup> Jan-Ole Joswig<sup>1</sup> Nikolai Gaponik<sup>1</sup> Ute Resch-Genger<sup>2</sup> Alexander Eychmüller<sup>1</sup>

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P084

**Solution-phase photon correlation reveals ensemble-averaged biexciton quantum yield of semiconductor nanocrystals**

Andrew P. Beyler <sup>1,\*</sup> Thomas S. Bischof <sup>1</sup> Jian Cui <sup>1</sup> S. Leigh Heathcote <sup>1</sup> Mounji G. Bawendi <sup>1</sup>

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P086

**Probing the Dependence of Exciton-Phonon Coupling on the Size, Structure, and Composition of Nanocrystals Using Photon-Correlation Fourier Spectroscopy**

Jian Cui <sup>1,\*</sup> Liam Cleary <sup>2</sup> Andrew Beyler <sup>2</sup> Jianshu Cao <sup>2</sup> Mounji Bawendi <sup>2</sup>

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P088

**Relationships between Photoluminescence Spectra, Lifetime, and Polarization Anisotropy on Single Heterostructured Nanocrystals Exhibiting Blinking**

Toshiyuki Ihara <sup>1,\*</sup> Ryota Sato <sup>1</sup> Toshiharu Teranishi <sup>1</sup> Yoshihiko Kanemitsu <sup>1</sup>

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P089

**Charge separation dynamics in type-II CdS/CdTe heteronanopencils revealed by femtosecond pump-probe spectroscopy**

Makoto Okano <sup>1,\*</sup> Masanori Sakamoto <sup>1</sup> Toshiharu Teranishi <sup>1</sup> Yoshihiko Kanemitsu <sup>1</sup>

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P090

**Fano Effect in Photoluminescence of Ag<sub>2</sub>S Nanoparticles with Adsorbed Rare Earth Ions**

Vitaliy M. Belous <sup>1,\*</sup> Alexander Yu. Akhmerov <sup>1</sup>

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P091

**Exciton density dynamics and dephasing in CdSe nanoplatelets**

Francesco Masia <sup>1,\*</sup> Ali Naeem <sup>1</sup> Sotirios Christodoulou <sup>2</sup> Iwan Moreels <sup>2</sup> Paola Borri <sup>3</sup> Wolfgang Langbein <sup>1</sup>

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P092

**Fano Effect in Photoluminescence of Ag<sub>2</sub>S Nanoparticles with Adsorbed Polymethine Dye**

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P093

**Easily-Synthesized Au-Cu<sub>2</sub>O Nanocrystals and Their Optical Properties**

Noga Meir <sup>1,\*</sup> Omri Bar-Elli <sup>1</sup> Dan Oron <sup>1</sup> Taleb Mokari <sup>2</sup>

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P094

**Size dependence of exciton recombination dynamics in CdSe/CdS dot-in-rod colloidal nanostructures**

Louis Biadala <sup>1,\*</sup> Benjamin Siebers <sup>1</sup> Zeger Hens <sup>2</sup> Dmitri Yakovlev <sup>1,3</sup> Manfred Bayer <sup>1</sup>

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P095

**Thick shell CdSe/CdS quantum dots with improved optical properties**

Michel Nasilowski<sup>1,\*</sup>, Piernicola Spinicelli<sup>1</sup>, Gilles Patriarche<sup>2</sup>, Benoit Dubertret<sup>1</sup>  
<sup>1</sup>LPEM, ESPCI, Paris, <sup>2</sup>LPN, CNRS, Marcoussis, France

P096

**Spectral and temporal properties of sub-10 nm fluoride nanocrystals doped with lanthanide ions**

Artur Podhorodecki<sup>1,\*</sup>, Mateusz Banski<sup>1</sup>, Agnieszka Noculak<sup>1</sup>  
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P097

**Tuning the Emission Colors of Semiconductor Nanocrystals Beyond their Bandgap Tunability: All in the Dope**

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P098

**Distance scaling of the energy transfer rate between a single semiconductor nanostructure and a graphene monolayer**

François Federspiel<sup>1</sup>, Guillaume Froehlicher<sup>1</sup>, Michel Nasilowski<sup>2</sup>, Silvia Pedetti<sup>2</sup>, Benoît Dubertret<sup>2</sup>, Ather Mahmood<sup>1</sup>, Bernard Doudin<sup>1</sup>, Serin Park<sup>3</sup>, Jeong-O Lee<sup>3</sup>, David Halley<sup>1</sup>, Pierre Gilliot<sup>1</sup>, Stéphane Berciaud<sup>1,\*</sup>  
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P099

**Ligands Enhance Broadband Solar Light Absorption of Colloidal Quantum Dots**

Carlo Giansante<sup>1,\*</sup>, Eduardo Fabiano<sup>2</sup>, Roberto Grisorio<sup>3</sup>, Giovanni Lerario<sup>1</sup>, GianPaolo Suranna<sup>3</sup>, Giuseppe Gigli<sup>4</sup>  
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P100

**CdSe/CdS dot-in-rods photon statistics**

Mathieu Manceau<sup>1,\*</sup>, Stefano Vezzoli<sup>1</sup>, Luigi Carbone<sup>2</sup>, Massimo De Vittorio<sup>2</sup>, Alberto Bramati<sup>1</sup>  
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P101

**Absolute photoluminescence quantum yields of quantum dot-rods with various aspect ratios**

Christian Würth<sup>1,\*</sup>, Daniel Geißler<sup>1</sup>, Christopher Wolter<sup>2</sup>, Tobias Jochum<sup>3</sup>, Horst Weller<sup>2</sup>, Ute Resch-Genger<sup>1</sup>  
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P102

**Anisotropic colloidal nanocrystal: an efficient, non-blinking, single photon source at room-temperature**

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P103

**Optical, EPR and surface state XPS investigation of 0D ZnO nanostructures doped with rare earth ions**

Mokhotjwa Simon Dhlamini<sup>1,\*</sup>, Guy Kabongo<sup>1</sup>, Gugu Hlengiwe Mhlongo<sup>2</sup>, Bakang Moses Mothudi<sup>1</sup>, Thembele Hillie<sup>3</sup>, Hendrik Swart<sup>4</sup>  
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P104

**Amplified spontaneous emission from water-soluble CdSe/CdS quantum dot-in-rods**

Joel Grim<sup>1,\*</sup> Francesco Di Stasio<sup>1</sup> Vladimir Lesnyak<sup>1</sup> Roman Krahné<sup>1</sup> Liberato Manna<sup>1</sup> Iwan Moreels<sup>1</sup>  
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P105

**The Ultimate Limit to the Transition Linewidth of Colloidal Quantum Dots**

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P106

**Surface composition controls the optical properties of alloyed QDs encapsulated in silica shells**

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P107

**Determination of the orientation of a single nano-emitter by polarisation analysis**

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P109

**Thermal activation of Auger recombinations and blinking suppression in thick-shell CdSe/CdS colloidal nanocrystals**

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P110

**Reduced Auger recombination in single CdSe/CdS nanorods**

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P111

**Electroabsorption by 0D, 1D and 2D Nanocrystals: A Study of CdSe Colloidal Quantum Dots, Nanorods and Nanoplatelets**

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P112

**Relaxation dynamics of excited states in CdSe and PbS nanocrystals grown in a glass matrix.**

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P113

**Studying Colloidal Quantum Dots with 2D-Fourier Transform Spectroscopy**

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P114

**Chemical transformations in Colloidal Inorganic Nanocrystals**

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Plasmonic structures and nanocrystals

P115

**Highly Directional Emission of Photons from Nanocrystal Quantum Dots Positioned on Circular Plasmonic Lens Antennas**

Ronen Rapaport<sup>1,\*</sup> Moshe Harats<sup>1</sup> Nitzan Livneh<sup>1</sup> Shira Yochelis<sup>1</sup> Yossi Paltiel<sup>1</sup>

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P116

**Suppressed-blinking plasmonic quantum dot/gold heterostructures**

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P117

**CdSe/CdS nanocrystals for plasmonic patch antenna**

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P118

**Plasmon excitation and induced emission with a plasmonic self-organized crystal**

Laurent Coolen<sup>1,\*</sup> Hugo Frederich<sup>1</sup> Clotilde Lethiec<sup>1</sup> Julien Laverdant<sup>2</sup> Catherine Schwob<sup>1</sup> Traian Popescu<sup>3</sup> Ludovic Douillard<sup>3</sup> Agnès Maître<sup>1</sup>

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Spins in nanocrystals

P119

**Manipulation of electron spins in Mn-doped colloidal PbS quantum dots**

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P120

**100% Energy transfer in molecules/nanotubes supramolecular assemblies**

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P121

**Low frequency vibrations from CdSe nanoplatelets**

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