SYMPOSIUM ED4

Luminescent Materials for Photon Upconversion
April 18 - April 20, 2017

Symposium Organizers
John Capobianco, Concordia University
Andrew Ferguson, National Renewable Energy Laboratory
Dayong Jin, University of Technology, Sydney
Wounjhang Park, University of Colorado

Symposium Support
Nano Convergence | Korea Nano Technology Research Society
National Renewable Energy Laboratory

Proceedings Statement
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* Invited Paper

SESSION ED4.1: Applications of Inorganic Upconversion Materials I
Session Chair: Won Park
Tuesday Morning, April 18, 2017
PCC North, 100 Level, Room 128 A

10:30 AM *ED4.1.01
New Upconversion Schemes for Efficient Solar Harvesting and Biological Force Sensing Jennifer A. Dionne; Stanford University, United States.

11:00 AM ED4.1.02
Photovoltaics—Upconversion Configurations versus Tandem Cells Joop van Deelen; TNO, Netherlands.

11:15 AM *ED4.1.03
Optimization of Up-Conversion Photonic Markers Based on a La_2O_3 Host for Plastics Recycling and Anti-Counterfeiting Applications Bryce S. Richards; Karlsruhe Institute of Technology (KIT), Germany.

11:45 AM ED4.1.04
Upconversion Nanoprobe using Bispecific Antibody Hao He; Institute for Biomedical Materials and Devices, Faculty of Science, University of Technology, Australia.

SESSION ED4.2: Applications of Inorganic Upconversion Materials II
Session Chairs: Dayong Jin and Fan Zhang
Tuesday Afternoon, April 18, 2017
PCC North, 100 Level, Room 128 A

1:30 PM *ED4.2.01
NIR Nanomaterials for Disease Diagnostics and Therapy Fan Zhang; Fudan University, China.

2:00 PM ED4.2.02
Orthogonal Near-Infraed Upconversion Co-Regulated Site-Specific O_2 Delivery and Photodynamic Therapy for Hypoxia Tumor by Using Red Blood Cell Microcarriers Peiyuan Wang; Fudan University, China.

2:15 PM ED4.2.03
Upconversion Nanoparticles Y_2O_3 and Gd_2O_3 Co-Doped with Er^{3+} and Yb^{3+} with Aminosilane-Folic Acid Functionalization for Breast and Cervix Cancer Cell Detection Dalia H. Chavez; CICESE, Mexico.

2:30 PM ED4.2.04
Upconversion Nanoparticles for Tumor Imaging Mingyuan Gao; Institute of Chemistry, Chinese Academy of Sciences, China.

2:45 PM ED4.2.05
Develop Multi-Functional Contrast Agent for Deep Tissue In Vivo Bioimaging Shihui Wen[1, 2]; [1]University of Technology Sydney, Australia; [2]Macquarie University, Australia.

3:00 PM BREAK

3:30 PM *ED4.2.06
Upconverting Lipid Vesicles in Bioimaging and Photochemotherapy Sylvestre Bonnet; Leiden University, Netherlands.

4:00 PM ED4.2.07
Bright and Force-Sensitive Upconverting Nanoparticles Derek Wang; Stanford University, United States.

4:15 PM *ED4.2.08
Security Applications of Upconverting Nanocrystals Paul S. May; University of South Dakota, United States.

4:45 PM ED4.2.09
Active Thermal Extraction and Temperature Sensing of Near-Field Thermal Radiation Taeyong Kim; California Institute of Technology, United States.

SESSION ED4.3: Synthesis and Characterizations of Inorganic Upconversion Materials
Session Chairs: John Capobianco and Chun-Hua Yan
Wednesday Morning, April 19, 2017
PCC North, 100 Level, Room 128 A

8:15 AM *ED4.3.01
Lanthanide Upconversion Nanocrystals—Synthesis, Energy Transfer Management and Bioapplication Chun-Hua Yan; College of Chemistry, Peking University, China.

8:45 AM ED4.3.02
Synthesis and Characterization of Er-Doped Indium Tin Oxide for Upconverting Transparent Conductor Suehyun Cho; University of Colorado, United States.

9:00 AM ED4.3.03
Microstructural Characterization of Rare-Earth Doped Fluoride Nanocrystals for Cold Brownian Motion Xuezhe Zhou; University of Washington, United States.

9:15 AM ED4.3.04
Scale-Up of the Synthesis of Upconversion Nanoparticles Aravind Baride; University of South Dakota, United States.

9:30 AM ED4.3.05
Upconversion Processes and Internal Net Optical Gain in Single-Cystal Erbium Chloride Silicate Nanowires Hao Sun; Tsinghua University, China.

9:45 AM ED4.3.06
Design and Synthesis of Upconversion Nanoparticles for Lifetime- and Intensity-Based Sensing Applications Thomas Hirsch; University of Regensburg, Germany.

10:00 AM BREAK

10:30 AM *ED4.3.07
Controlling Photon Upconversion in Lanthanide-Doped Nanocrystals Xiaogang Liu; National University of Singapore, Singapore.

11:00 AM ED4.3.08
Inorganic Nanocrystals Functionalized Mesoporous Silica—From Symmetry to Asymmetry Xiaomin Li; Fudan University, China.

11:15 AM ED4.3.09
Chemically and Structurally Flexible Hosts for Yb-Er Sensitizer-Activator Pairs Federico A. Rabuffetti; Wayne State University, United States.

11:30 AM ED4.3.10
Crystal Structure, Point Symmetry and Absolute Upconversion Quantum Yield—Towards the Rational Design of Efficient Lanthanide-Doped Upconverting Nanocrystals Damien Hudry; Karlsruhe Institute of Technology, Germany.

11:45 AM ED4.3.11
The Anisotropic Surface Properties of Upconversion Nanocrystals Wei Ren[1,2]; [1]Institute for Biomedical Materials & Devices (IBMD), School of Mathematical and Physical Sciences, University of Technology Sydney, Australia; [2]Advanced Cytometry Laboratories, ARC Centre of Excellence for Nanoscale BioPhotonics (CNBP), Macquarie University, Australia.

SESSION ED4.4: Photonic Control of Upconversion
Session Chairs: Mary Berry and P James Schuck
Wednesday Afternoon, April 19, 2017
PCC North, 100 Level, Room 128 A

1:30 PM *ED4.4.01
Enhancing Lanthanide Upconversion with Molecular Concentrators, Micro Pillars and Energy-Looping Nanoparticle-Based Lasers Peter J. Schuck; Lawrence Berkeley National Laboratory, United States.

2:00 PM ED4.4.02
Plasmon-Enhanced Upconversion Luminescence in the Metal-Insulator-Metal Cylindrical Nanostrucutres Gumin Kang; University of Colorado, United States.

2:15 PM ED4.4.03
Spectroscopic Imaging of NIR to Visible Upconversion from $NaYF_4$:Yb^{3+},Er^{3+}(Tm^{3+}) Nanoparticles on Plasmonic Nano-Arrays Steve Smith; South Dakota School of Mines and Technology, United States.

2:30 PM BREAK

3:30 PM *ED4.4.04
Up-Conversion Technology—Are All Questions Answered? Artur Bednarkiewicz[1,2]; [1]Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Poland; [2]Wroclaw Research Centre EIT+, Poland.

4:00 PM ED4.4.05
Inhibited Spontaneous Emission in Nanocavities for More Efficient Energy Pooling Upconversion Michael LaCount; Colorado School of Mines, United States.

4:15 PM ED4.4.06
Nanoplasmonic Upconverting Nanoparticles as Orientation Sensors for Single Particle Microscopy Shuang Fang Lim; North Carolina State University, United States.

4:30 PM ED4.4.07
Disordered Media for Plasmonics-Driven Upconversion—Anderson Localization for Strong Near-Field Seok Joon Kwon; Korea Institute of Science and Technology, Korea (the Republic of).

4:45 PM ED4.4.08
From Blue to Near-Infrared Continuous-Wave Upconverted Lasing Action from Lanthanide Doped Nanocrystals in Microcavities Angel Bravo; Lawrence Berkeley National Laboratory, United States.

SESSION ED4.5: Poster Session: Photon Upconversion Materials
Session Chair: Won Park
Wednesday Afternoon, April 19, 2017
8:00 PM - 10:00 PM
Sheraton, Third Level, Phoenix Ballroom

ED4.5.01
A General Strategy for Ligand Exchange on Upconversion Nanoparticles Wei Kong; City University of Hong Kong, Hong Kong.

ED4.5.02
Successful Fabrication of GaN Epitaxial Layer on Non-Catalytically-Grown Graphene for Photon Upconversion Sungwon Hwang; Konkuk University, Korea (the Republic of).

ED4.5.03
Liquid-Phase Laser Ablation as a Method to Produce Upconverting Nanomaterials Rosemary L. Easterday; University of Kentucky, United States.

ED4.5.04
Crystal Structure Features and Luminescent Properties of the Copper-Doped Ca-Eu Apatite Mariam Pogosova; Skolkovo Institute of Science and Technology, Russian Federation.

ED4.5.05
NIR-to-NIR Upconversion Nanoparticle Applications in Security Printing, Fingerprint Imaging and Beyond Aravind Baride; University of South Dakota, United States.

ED4.5.06
Core-Shell Nd^{3+}-doped Upconversion Nanoparticles with Enhanced Luminescence Properties for Bioanalytical Applications Lisa M. Wiesholler; University of Regensburg, Germany.

ED4.5.07
The Dispersion Stability of Upconverting Nanoparticle Inks Khadijah Cessac; Southern University and A&M College, United States.

ED4.5.08
The Effects of Rapid Energy Migration on Upconversion Luminescence in β-$NaYF_4$:Yb,Er Nanomaterials Md Yeathad Hossan; University of South Dakota, United States.

ED4.5.09
Real-Time Spectroscopic Monitoring of the Synthesis of Core/Shell β-$NaYF_4$ Nanocrystals with Active and Passive Shells Lance N. Kotter; University of Jamestown, United States.

ED4.5.10
Triplet-Triplet Annihilation Upconversion in Thin Film Polystyrene Copolymers Abagail K. Williams; The University of Southern Mississippi, United States.

ED4.5.11
Distance Dependence of Gold-Enhanced Upconversion Luminescence in Au/SiO_2/Y_2O_3:Yb^{3+}, Er^{3+} Nanoparticles M Liu; University of Science and Technology of China, China.

ED4.5.12
Production and Characterization of Tb^{3+}/Yb^{3+} Co-Activated AlN Thin Films for Down-Conversion Applications in Photovoltaic Cells Karem Y. Tucto Salinas; Pontificia Universidad Catolica del Peru, Peru.

ED4.5.13
Red-Emitting Magnetic Mesocomposites of Ag-Decorated Fe_3O_4@ SiO_2 Nanoflowers Coated with Y_2O_3:Eu^{3+}: Study of Iron Oxide Induced Luminescence Quenching Latif U. Khan; University of Sao Paulo, Brazil.

ED4.5.14
A Hybrid Molecular-Nanocrystal Platform for Photon Upconversion MingLee Tang; University of California, Riverside, United States.

SESSION ED4.6: Theory and Spectroscopy
Session Chair: Artur Bednarkiewicz
Thursday Morning, April 20, 2017
PCC North, 100 Level, Room 128 A

8:30 AM *ED4.6.01
Real-Time Spectroscopic Monitoring and Mathematical Modelling of the Synthesis and Modification of $NaYF_4$ Nanocrystals Mary Berry; University of South Dakota, United States.

9:00 AM ED4.6.02
Energy Transfer Dynamics in Dye-Sensitized Lanthanide-Doped Nanoparticles for Solar Upconversion David J. Garfield; University of California, Berkeley, United States.

9:15 AM ED4.6.03
Effect of Nanoparticle Size on Time-Resolved Upconversion Resonance Energy Transfer Verena Muhr; University of Regensburg, Germany.

9:30 AM ED4.6.04
Core/Shell Structured Upconversion Nanoparticles with Controllable Interfacial Energy Migration for Spectral and Lifetime Multiplexing Ling-Dong Sun; Peking University, China.

9:45 AM ED4.6.05
Interface Energy Transfer Modeling on Alkali Rare-Earth Fluoride Related Core Shell Nanostructures—For Future Multi-Layer Core Shell Luminescence Materials Bolong Huang; Department of Applied Biology and Chemical Technology, The Hong Kong Polytechnic University, Hong Kong.

10:00 AM BREAK

SESSION ED4.7: Applications of Organic Upconversion Materials
Session Chair: Andrew Ferguson
Thursday Morning, April 20, 2017
PCC North, 100 Level, Room 128 A

10:30 AM *ED4.7.01
The Application of Photochemical Upconversion to Photovoltaics Timothy Schmidt; UNSW, Australia.

11:00 AM ED4.7.02
Intermediate Band Dye-Sensitised Solar Cells Utilising Triplet-Triplet Annihilation Andrew Nattestad; University of Wollongong, Australia.

11:15 AM *ED4.7.03
Photon Upconversion Dye-Sensitized Solar Cells via Self-Assembled Multilayers Kenneth Hanson[1, 2]; [1]Florida State University, United States; [2]Florida State University, United States.

11:45 AM ED4.7.04
Photonic Crystal Boosted Triplet-Triplet Annihilation Upconversion Changqing Ye; Suzhou University of Science and Technology, China.

SESSION ED4.8: Novel Inorganic and Organometallic Chromophores for Photon Upconversion
Session Chair: Timothy Schmidt
Thursday Afternoon, April 20, 2017
PCC North, 100 Level, Room 128 A

1:30 PM *ED4.8.01
Framing Upconversion Materials—Fluorescent Metal-Organic Frameworks Angelo Monguzzi; Università degli Studi Milano-Bicocca, Italy.

2:00 PM ED4.8.02
Looking for Molecular Erbium Complexes with Dual Emission for Molecular-Based Upconversion Bahman Golesorkhi; University of Geneva, Switzerland.

2:15 PM ED4.8.03
Efficient Infrared-to-Visible Upconversion with Sub-Solar Irradiance Melika Mahboub; University of California Riverside, United States.

2:30 PM ED4.8.04
Sandwich-Like Palladiumphthalocyanine—Highly Efficient NIR Sensitizer for Low Power Upconversion Xiaomei Wang; Suzhou University of Science and Technology, China.

2:45 PM ED4.8.05
Interference-Enhanced Solid-State Infrared-to-Visible Upconversion Sensitized by Nanocrystals Mengfei Wu; Massachusetts Institute of Technology, United States.

3:00 PM BREAK

SESSION ED4.9: Host Material Development for Organic Photon Upconversion
Session Chairs: Andrew Ferguson, Angelo Monguzzi and Timothy Schmidt
Thursday Afternoon, April 20, 2017
PCC North, 100 Level, Room 128 A

3:30 PM *ED4.9.01
Triplet-Triplet Annihilation Upconversion in the Aqueous and Dry Phases—Challenges, Solutions and More Problems Jaehong Kim; Yale University, United States.

4:00 PM ED4.9.02
Poly(Olefin Sulfone) Hosts for High-Efficiency Solid-State Triplet-Triplet Annihilation Up-Conversion Andrey Turshatov; Karlsruhe Institute of Technologie (KIT), Germany.

4:15 PM ED4.9.03
Thiol-Ene Click Chemistry for Solid State Triplet-Triplet-Annihilation Joseph Lott; University of Southern Mississippi, United States.

4:30 PM ED4.9.04
Comparitive Study of Triplet-Fusion Induced Photon Energy Up-Converted Delayed Luminescence in Solution-Processable Blend Films of Pt^{II}Octaethyl Porphyrin Model Composites Panagiotis E. Keivanidis; Cyprus University of Technology, Cyprus.