

Postdoctoral fellow
Delia Milliron group - The Molecular Foundry
Lawrence Berkeley National Laboratory, MS67R3207, Berkeley, CA, USA
jongwookkim@lbl.gov (Tel. +1.510.303.0788)
Date and place of birth: 18, September, 1984 / Republic of Korea

RESEARCH INTEREST

Developing multi-functional nano-materials for electrochemical and optical applications

- Synthesis and assembly of colloidal nanoparticles (metal oxide, rare earth, noble metals, polymers...)
- Dynamic control of anisotropic optical, electrical, and magnetic properties
- Promoting ion and electron transport phenomena via organic-inorganic heterostructures
- Applications to energy devices (electrochromic windows, batteries, solar cells...)

EDUCATION

- Jan 2014 – present **Postdoc. Lawrence Berkeley National Laboratory USA**
Delia Milliron group – The Molecular Foundry
Theme : “Nanocrystal synthesis, assembly, applications to electrochemical and optical systems”
- Sept 2010 – Dec 2013 **Ph.D. Ecole Polytechnique FRANCE**
Material Science - Laboratoire de Physique de la Matière Condensée (LPMC)
Thesis : “Synthesis of anisotropic colloidal nanocrystals and their electro-optical properties”
Advisor : Prof. Thierry Gacoin
- Sept 2006 – Nov 2009 **M.S. Ecole Centrale Paris FRANCE**
Chemical Engineering
Thesis : “Surface-plasmonic enhancement of luminescent thin film emission”
Advisor : Prof. Arsène Isambert & Prof. Thierry Gacoin
(One-year leave of absence for the compulsory military service in Korea ^{Sept2007 ~ Aug2008})
- Feb 2002 – Aug 2006 **B.S. Korea Advanced Institute of Science and Technology (KAIST)**
Chemical & Biomolecular Engineering
Advisor : Prof. Seung-Bin Park

RESEARCH EXPERIENCE

- Dec 2009 – Aug 2010 **Korea Institute of Science and Technology (KIST)**
Research staff “Transparent conductive thin films (TCF) for solar cells”
Synthesis and deposition of metal nanofiber network by electro-spinning/spraying methods
Fabrication of dye-sensitized solar cells using catalytic and conductive Pt nanofiber network electrodes
- Apr 2009 – Nov 2009 **SAINT GOBAIN Research Center & Ecole Polytechnique**
Master research intern “Surface plasmonic enhancement of luminescent thin film emission”
Synthesis of noble metal nanoparticles and their immobilization on large area substrates
Analysis of plasmon-modified optical properties of multi-layered luminescent thin film structures
- Nov 2008 – Mars 2009 **Process and Material engineering Lab. (LGPM) – Ecole Centrale Paris**
Participating researcher “Organic compounds analysis by GC-MS for the exobiological interest – Application to Mars Organic Molecules Analyzer (Mission EXOMARS – ESA & NASA)”
Verification of the stability of MTBSTFA derivative at the extraterrestrial conditions
Separative detection of enantiomeric amino acids at the condition for Mars rover
- Jun 2007 – Aug 2007 **SAMSUNG Advanced Institute of Technology (SAIT)**
Research intern “New materials for PEMFC membranes and additives”
Synthesis of imide-based Polymer Electrolyte Membranes and additives
Fabrication and performance test of single cell pilot Membrane Electrode Assemblies
- Dec 2005 – Jan 2006 **LG Chem. Research Park**
Intern “Heat exchangers and fuel filters in DMFC system”
Investigation of heat exchanger and filter design for portable DMFC system
- Jul 2003 – Aug 2003 **Superlattice & Nanomaterials Lab (Prof. Seung-Man Yang) - KAIST**
Undergraduate research program
“synthesis and size control of polystyrene nanospheres by emulsion copolymerization”

TEACHING EXPERIENCE

- Oct 2010 – Jun 2012 **Teaching assistant – Ecole Polytechnique, Dept. of Physics and Chemistry**
CHI583 – Optical system modeling / CHI572 – Separation process / TP M2R – Nanoparticle synthesis
- Oct 2007 – Apr 2008 **Instructor – SEOUL National Science Museum**
Science experiment instructor / Exhibition instructor for visiting students
(Carried out as an alternative military service in Korean government)
- Fev 2004 – Aug 2004 **Part-time lecturer – Institute of Advanced Education for Gifted Student – KAIST**
Physics lecture for gifted high school students / Teaching materials publication
- 2002 – 2008 **Private tutor (Mathematics, Physics, Chemistry...)**
Continuous private tutoring for high school students during 7 years for living expenses

PUBLICATIONS

Journal Articles

- J Kim**, J Peretti, K Lahlil, J-P Boilot, T Gacoin, "Optically anisotropic thin films by shear-oriented assembly of colloidal nanorods" *Adv. Mater.* 25, 3295-3300 (2013)
- J Kim**, J Kang, U Jeong, H Kim, H Lee, "Catalytic, conductive, and transparent platinum nanofiber webs for FTO-free dye-sensitized solar cells" *ACS Appl. Mater. Interfaces.* 5 (8), 3176-3181 (2013)
- J Kim**, A de la Cotte, R Deloncle, S Archambeau, C Biver, J-P Cano, K Lahlil, J-P Boilot, E Grelet, T Gacoin, "LaPO₄ mineral liquid crystalline suspensions with outstanding colloidal stability for electro-optical applications" *Adv. Funct. Mater.* 22, 4949-4956 (2012)
- J Kim**, G Dantelle, A Revaux, M Bérard, A Huignard, T Gacoin, J-P Boilot, "Plasmon-induced modification of fluorescent thin film emission nearby gold nanoparticle monolayers" *Langmuir* 26 (11), 8842-8849 (2010)
- J Kim**, K Lahlil, J-P Boilot, T Gacoin, J Peretti, "Optimized combination of intrinsic and form birefringence in highly-aligned LaPO₄ nanorods thin films and solutions" *Submitted*

Proceedings

- J Kim**, J Peretti, K Lahlil, J-P Boilot, T Gacoin, "Large area directed assembly of colloidal nanorods into optically anisotropic thin films" *MRS Spring Meeting 2013* (Oral)
- J Kim**, J Peretti, K Lahlil, J-P Boilot, T Gacoin, "Inorganic thin film wave plates by shear-directed assembly of colloidal nanorods" *MRS Spring Meeting 2013* (Oral)
- J Kim**, K Lahlil, J-P Boilot, T Gacoin, "Surfactant-Free Synthesis of Inorganic Liquid Crystalline Nanorods" *MRS Spring Meeting 2013* (Poster)
- J Kim**, A de la Cotte, R Deloncle, S Archambeau, C Biver, J-P Cano, K Lahlil, J-P Boilot, E Grelet, T Gacoin, "Liquid crystalline behaviour of colloidal LaPO₄ nanorod suspensions" *ACS Fall Meeting 2012* (Oral)
- J Kim**, G Dantelle, A Revaux, M Bérard, A Huignard, T Gacoin, J-P Boilot, "Plasmon-induced modification of fluorescent thin film emission nearby gold nanoparticle monolayers" *Annual Meeting of Korean Scientist Association in France 2010*, Paris, France (Poster)
- J Kim**, K Lahlil, J-P Boilot, E Grelet, T Gacoin, "Luminescent mineral liquid crystals for photonic applications" *European Congress on Advanced Materials and Process – EuroMat 2011*, Montpellier, France (Poster)

Patents

- "Fabrication process of solid mineral transparent and birefringent thin film and optical component of the same"
(2012D10002 FR I257185)
- "Dye sensitized solar cell and method for manufacturing the same"
(10-2010-0095139 KR)

SKILLS

Fabrication

nanoparticle synthesis (metal oxides, rare earths, Au, Ag, polymers...) / nanofiber synthesis by electro-spinning / sol-gel methods / film coating processes / spraying / microfluidic channel fabrication / photolithography

Measurement and Characterization

Laser Scanning Confocal Microscopy / Scanning Electron Microscopy (SEM) / Transmission Electron Microscopy (TEM) / Atomic Force Microscopy (AFM) / X-Ray Diffraction (XRD) / diverse optical spectroscopy techniques (DLS, UV-Vis, fluorescence...) / Ellipsometry / Profilometry / Gas Chromatography / Mass Spectrometry / Electrochemical Impedance Spectroscopy (EIS)

Tools

MatLab / Mathematica / Java / Comsol / Opus / Origin / Flash / Photoshop / Illustrator / SketchUp

Language

English (advanced level) / French (advanced level) / Korean (native)

COLLABORATION

- Aprl 2012 – present **Prof. A.M. Brouwer – Van't Hoff Institute for Molecular Science, University of Amsterdam**
Confocal microscopy for single-particle polarized emission measurement
- Aprl 2011 – present **Prof. Charles Baroud – Laboratoire d'Hydrodynamique (LadHyX), Ecole Polytechnique**
Microfluidic channel fabrication and measurement
- Sept 2010 – Aug 2012 **ESSILOR International**
Synthesis and characterization of anisotropic nanoparticles, Funding
- Sept 2010 – Aug 2012 **Dr. Eric Grelet - Centre de Recherche Paul-Pascal, Bordeaux FRANCE**
Electro-optical measurement of liquid crystalline colloidal suspensions
- Jan 2011 – May 2012 **Prof. Alexandrou Antigoni – Laboratoire Optique et Bioscience (LOB), Ecole Polytechnique**
Fluorescence optical microscopy for single-particle detection

GRANTS & SCHOLARSHIPS

- Aug 2012 – present **LaserLab EUROPE**
Funding and access to LaserLab facilities during collaboration with Van't Hoff institute
- Sept 2010 – present **'Gaspard Monge' scholarship – Ecole Polytechnique**
Full tuition and fees + monthly allowance (2100 euros/month) during Ph.D. course
Funding for overseas training to encourage international collaboration
- Sept 2006 – Aug 2009 **'Blaise Pascal' excellence scholarship – French Ministry of Foreign Affaires**
Full tuition and fees + monthly allowance (1500 euros/month) during Master's course
- Fev 2002 – Aug 2006 **Scholarship of Korea Ministry of Patriots & Veterans Affairs**
Full academic tuition and fees during B.S. course
- 2003 **LG Chem. fellowship**
Grant for high-achieving undergraduate students

EXTRA ACTIVITIES

- May 2012 – present **President of 'Blaise Pascal' excellence scholarship students**
- Sept 2006 – Aug 2007 **Executive member of Korean Scientist Association in France (ASCoF)**
- Mars 2002 – Aug 2006 **Member of KAIST CHORUS**
- Sports** – regularly playing tennis and swimming