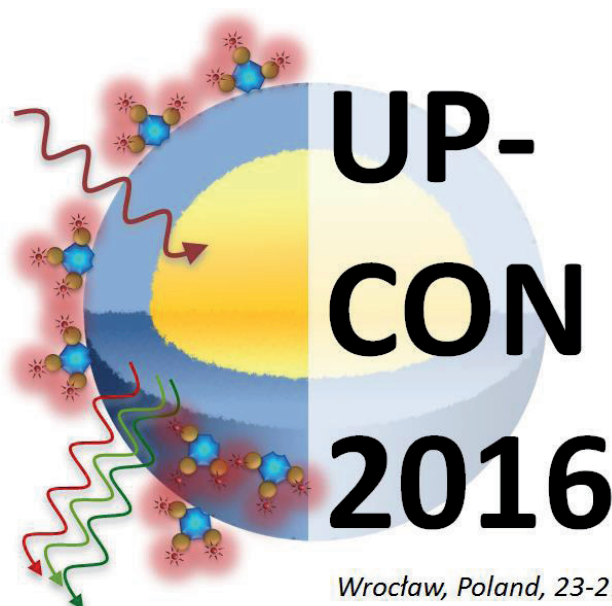


**1<sup>ST</sup> CONFERENCE AND SPRING SCHOOL  
ON PROPERTIES, DESIGN AND APPLICATIONS OF  
UPCONVERTING NANOMATERIALS**



*Wrocław, Poland, 23-27 May 2016*

**S C H O O L   B O O K**

Chairmen

**ARTUR BEDNARKIEWICZ, HANS GORRIS and TERO SOUKKA**

Conference venue

**OSSOLINEUM LIBRARY & MUSEUM**

**23<sup>rd</sup> -27<sup>th</sup> of May, 2016   WROCŁAW, POLAND**

Secretary:

**Łukasz Marciniak**

Edited by:

**Artur Bednarkiewicz, Łukasz Marciniak, Aleksandra Pilch**

Cover design:

**Łukasz Marciniak and Artur Bednarkiewicz**

The conference and the publication are co-financed by:



**COST Action CM1403**

***The European Upconversion Network: From the Design of Photon-Upconverting Nanomaterials to Biomedical Applications***



***COST is supported by the EU Framework Programme Horizon 2020.***

Conference website

<http://www.upcon2016.pl>

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ISBN: 978-83-7493-940-9

Druk i oprawa: beta-druk, [www.betadruk.pl](http://www.betadruk.pl)

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General schedule:

	Monday 23 <sup>rd</sup>	Tuesday 24 <sup>th</sup>	Wednesday 25 <sup>th</sup>	Thursday 26 <sup>th</sup>	Friday 27 <sup>th</sup>
Morning	Conference	Conference	Conference	School	School
Afternoon	Conference	Conference	Conference	School	School
Late afternoon	COST MC meeting	Panel discussion	School	Short presentations	School
Evening	Conference dinner	Poster session	School	School dinner	Exercises

The programme of Spring school

Day 1			Notes	Time [h:m]
14:45	15:00	Welcome to UPCON Spring School		
15:00	16:00	<b>Chun-Hua Yan - Controllable Synthesis of High-Quality Rare Earth-Based Nanocrystals</b>		1:00
16:15	17:15	<b>Dayong Jin - Controlling upconversion nanocrystals for emerging applications</b>		1:00
17:15	17:30	Coffee break (coffee/tea, cookies)		0:15
17:30	18:30	<b>Claude Piguet - Upconversion using linear optics in molecular lanthanide complexes: from dream to reality</b>	L1	1:00
<b>Day 2</b>				
9:00	10:00	<b>Hans Tanke - Upconverting phosphors as labels for low cost lateral flow assays to monitor infectious diseases</b>	L2	1:00
10:15	11:15	<b>Mary T. Berry - Development of Quantitative Mechanistic Models for Up-conversion in Lanthanide-doped Nanomaterials</b>	L3	1:00
11:15	11:30	Coffee break (coffee/tea, cookies)		0:15
11:30	12:30	<b>Frank C.J.M. van Veggel - On Ln<sup>3+</sup> based core-shell nanoparticles as a method to increase quantum yield of non-linear processes</b>		1:00
12:30	13:30	Lunch break		1:00
13:30	14:30	<b>Markus Haase - Growth mechanisms of NaREF<sub>4</sub> nanocrystals</b>	L4	1:00
14:45	15:45	<b>Guanying Chen - Photon Upconversion Nanomaterials: Technologies and Biomedical Applications</b>	L5	1:00
15:45	16:00	Coffee break		0:15
16:00	...	Short presentations from participants (max.5 min 1-2 slides per participant)		~3:00
20:00	22:00	Joined school dinner (Novocaina restaurant)		
<b>Day 3</b>				
9:00	10:00	<b>Emory M. Chan - Combinatorial and computational strategies for the high-throughput design of upconverting nanoparticles</b>		1:00
10:00	11:00	<b>Daniel Jaque – Luminescent nanoparticles for in vivo imaging</b>	L6	1:00
11:00	11:15	Coffee break (coffee/tea, cookies)		0:15
11:15	12:15	<b>Steve Smith - Controlling Energy Transfer Upconversion by Engineering the Photonic Density of States</b>	L7	1:00
12:15	13:15	<b>Tero Soukka - Upconverting nanophosphors as reporters in multiplexed immunoassay</b>		1:00
13:15	13:30	Discussion and End of School		
13:30	14:30	Lunch break		1:00
14:30	18:00	Trip to labs and experimental session		

# **LIST OF ABSTRACTS**

WITH PRESENTING AUTHORS

*School presentations (chronological order)*

<b>Presentation No.</b>	<b>First Name</b>	<b>Last Name</b>	<b>Abstract title</b>
SP1	Sangeetha	Balabhadra	OPTICAL THERMOMETRY BASED ON THE LANTHANIDE LUMINESCENCE OF INORGANIC NANOSYSTEMS
SP2	Alkit	Begiraj	CO-DOPING UPCONVERSION NANOPARTICLES WITH TRANSITION METAL IONS
SP3	Shashi	Bhuckory	MORPHOLOGICAL AND OPTICAL CHARACTERIZATION OF PEGYLATED- $\text{Er}^{3+}$ , $\text{Yb}^{3+}$ -DOPED $\text{NaGdF}_4$ UPCONVERSION NANOPARTICLES FOR FRET
SP4	Dmitry	Busko	SPECTROSCOPIC CHARACTERIZATION OF BROAD SPECTRUM OF UPCONVERSION MATERIALS
SP5	Oleksii	Dukhno	OPTIMIZING UPCONVERTING NANOPARTICLES FOR FRET-BASED ASSAYS
SP6	Zayakhuu	Gerelkhuu	INFLUENCE OF $\text{Cr}^{3+}$ CONCENTRATION ON LUMINESCENCE PROPERTIES OF $\text{NaLuGdF}_4:\text{Cr}^{3+}/\text{Er}^{3+}$ UPCONVERSION SYSTEM
SP7	Bahman	Golesorkhi	SYNTHESIS AND CHARACTERISATION OF VISIBLE/NEAR INFRARED LUMINESCENT ERBIUM COORDINATION COMPLEXES
SP8	Bettina	Grael	Nd AS SENSITIZER IN $\text{NdYF}_4:\text{Yb},\text{Er},\text{Nd}$ TRI-DOPED UPCONVERSION NANOCRYSTALS
SP9	Justyna	Grzelak	ENERGY TRANSFER BETWEEN UP-CONVERTING NANOCRYSTAL AND ORGANIC POLYMER
SP10	Katarzyna	Zawisza	UP-CONVERTING $\text{Ca}_3(\text{PO}_4)_2$ NANOPARTICLES ACTIVATED WITH $\text{Er}^{3+}$ AND $\text{Yb}^{3+}$ ION PAIRS FOR BIOAPPLICATIONS
SP11	Cynthia Elisabeth	Kembuan	CYTOTOXICITY OF BIOCOMPATIBLE FUNCTIONALIZED HYDROPHILIC UPCONVERSION NANO-PARTICLES IN IN VITRO EXPERIMENTS
SP12	Uliana	Kostiv	SILICA-COATED UPCONVERSION LANTHANIDE NANOPARTICLES: THE EFFECT OF CRYSTAL DESIGN ON MORPHOLOGY, STRUCTURE AND OPTICAL PROPERTIES
SP13	Agnieszka	Kowalczyk	RATIOMETRIC DETECTION OF MONOCLONAL ANTIBODIES WITH LIPOPOLYSACCHARIDE FUNCTIONALIZED UPCONVERTING NANOPARTICLES
SP14	Sergey	Kuznetsov	UP-CONVERSION LUMINESCENCE OF DIAMOND FILMS WITH INTEGRATED $\text{La}_{0.895}\text{Yb}_{0.0875}\text{Er}_{0.0175}\text{F}_3$ NANOPARTICLES

SP15	Tero	Laihinien	NaYF <sub>4</sub> :Yb <sup>3+</sup> ,R <sup>3+</sup> UP-CONVERSION LUMINESCENCE MATERIALS
SP16	Giacomo	Lucchini	ALKALINE-EARTH FLUORIDE NANOPARTICLES ACTIVATED WITH Ln <sup>3+</sup> IONS FOR MULTIMODAL BIOIMAGING
SP17	Sebastian	Mackowski	FLUORESCENCE ENHANCEMENT AND ENERGY PROPAGATION IN PLASMONIC NETWORKS
SP18	Manoj Kumar	Mahata	REMOTE TEMPERATURE SENSING BELOW 300 K BY YVO <sub>4</sub> :Er <sup>3+</sup> /Yb <sup>3+</sup> UPCONVERTING PARTICLES
SP19	Łukasz	Marciniak	UP-CONVERTING RARE EARTH DOPED PHOSPHATES FOR NON-CONTACT TEMPERATURE SENSING
SP20	Michael	Meijer	LIPID ENCAPSULATION AND RUTHENIUM DECORATION OF UPCONVERTING NANOPARTICLES (UCNPS) FOR PHOTO-ACTIVATED CHEMOTHERAPY (PACT)
SP21	Diego	Mendez-Gonzalez	DENGUE miRNA BIOSENSOR BASED ON UCNPS AND GO
SP22	Matthias	Mickert	HIGHLY SENSITIVE LASER SCANNING OF PHOTON-UPCONVERTING NANOPARTICLES ON A MACROSCOPIC SCALE
SP23	Małgorzata	Misiak	ENHANCEMENT OF UP-CONVERSION LUMINESCENCE IN Yb <sup>3+</sup> Tb <sup>3+</sup> CO-DOPED CaF <sub>2</sub> NANOCRYSTALS BY SYNTHESIS MODULATION
SP24	Melissa-Jane	Monks	SPECTROSCOPIC STUDY OF LANTHANIDE-DOPED ALKALINE FLUORIDE UPCONVERSION NANOPARTICLES PREPARED VIA SOL GEL SYNTHESIS
SP25	Monirehalsadat	Mousavi	IMPROVED BACKSCATTERED LIGHT REJECTION IN UPCONVERTING NANOPARTICLE-BASED BIOIMAGING
SP26	Emilia	Palo	UP-CONVERSION MATERIALS TO ENHANCE SOLAR CELL CONVERSION
SP27	Aleksandra	Pilch	ENERGY TRANSFER UPCONVERSION ENHANCEMENT IN HETEROGENOUSLY RARE EARTH DOPED ACTIVE-CORE @ ACTIVE-SHELL (ACAS) NANOPARTICLES
SP28	Daria	Pominova	THEORETICAL MODELING OF UPCONVERSION LUMINESCENCE PLASMON ENHANCEMENT
SP29	Surya	Prakash Tiwari	APPLICATION OF UPCONVERTING Nd/Yb CO-DOPED YPO <sub>4</sub> NANOPARTICLES FOR SECURITY FUNCTION
SP30	Aleksander	Zięcina	UP-CONVERSION PROCESS IN BLUE EMITTING SrTiO <sub>3</sub> :Tm <sup>3+</sup> /Yb <sup>3+</sup> NANOPARTICLES



SP31	Katarzyna	Prorok	UP- AND DOWN-CONVERSION LUMINESCENCE OF Tb <sup>3+</sup> /Yb <sup>3+</sup> CODOPED Y <sub>2</sub> O <sub>3</sub> NANOPARTICLES
SP32	Dominika	Przybylska	FLUORIDE MATRICES DOPED BY LANTHANIDE IONS SHOWING UP - CONVERSION PHENOMENA
SP33	Benjamin	Ritter	NOVEL FLUOROLYTIC SOL-GEL SYNTHESIS OF RARE EARTH DOPED ALKALINE EARTH METAL FLUORIDE NANOPARTICLES
SP34	Paloma	Rodríguez-Sevilla	IN SITU SINGLE PARTICLE POLARIZED SPECTROSCOPY OF OPTICALLY TRAPPED UPCONVERTING NANORODS
SP35	Jarostaw	Rybusiński	MAGNETIC PROPERTIES OF UP-CONVERTING RARE-EARTH ORTHOVANADATES RELATED TO PARTICLE SIZE AND DOPANT CONCENTRATION
SP36	Maysoon	Saleh	UCNP AS FLUORESCENT DETECTORS FOR THE SENSITIVE AND SELECTIVE DETECTION OF TRANSITION METAL IONS IN AQUEOUS SOLUTIONS
SP37	Mirkomil	Sharipov	FUNCTIONALIZATION OF LANTHANIDES-DOPED UPCONVERSION NANOPARTICLES FOR BIOIMAGING
SP38	Artur	Tymiński	RARE EARTH PHOSPHATE NANOCRYSTALS (RE = Y <sup>3+</sup> , La <sup>3+</sup> , Gd <sup>3+</sup> , Lu <sup>3+</sup> ) DOPED BY Ln <sup>3+</sup> IONS SHOWING UP-CONVERSION LUMINESCENCE
SP39	Edyta	Wysokińska	CYTOTOXICITY OF BARE NaGdF <sub>4</sub> :Yb <sup>3+</sup> :Er <sup>3+</sup> NANOCRYSTALS ON MACROPHAGES
SP40	Nestor	Estebanez	FUNCTIONAL POLYMER-CAPPED UPCONVERSION NANOPARTICLES
SP41	Sebastian	Radunz	EFFECT OF THE DISSOLUTION OF FLUORIDE UCNPS ON THEIR OPTICAL PROPERTIES
SP42	Magdalena	Duda	ENERGY TRANSFER BETWEEN ORGANIC DYES ("ANTENNA") ATTACHED TO THE SURFACE OF UPCONVERTING NANOPARTICLES
SP43	Robert	Tomala	THE STUDY OF UP-CONVERSION EMISSION OF Y2Si2O7:Nd3+ NANOCRYSTALS

**W O R K S H O P  
I N F O R M A T I O N**

# The WORKSHOP

The workshop will be carried in the Wrocław Research Centre EIT+:

- Laboratory of Biospectroscopy and bioimaging, headed by dr hab. Artur Bednarkiewicz
- Laboratory of Transmission Electron Microscope, headed by dr Alicja Bachmatiuk
- Laboratory of Nanobioengineering, headed by dr Tomasz Lipiński

Workshop providers :

- Agnieszka Kowalczyk, Małgorzata Misiak, Katarzyna Prorok, Anna Siudzińska

Date : **Friday 27.05.2016 (14:30-18:00)** , departure at 14:30 from city centre (Panorama Raclawicka site). Transport to the laboratories will be provided by school organizers, all additional information regarding the trip will be given during school. Depending on number of participants, they will be divided into two or more groups.

More details will be provided during the school.

The Upconversion imaging experiments will be done with the use of inverted microscope Axio Observer.Z1. Experiments listed below will be done with the samples provided by participants/organizers:

- Setting up the up-conversion mode
- Imaging of UCNPs and spectra acquisition from under the microscope with the use of ANDOR Shamrock 303i
- Acquiring Z-stack images
- Combined fluorescence + UC images

