

# CURRICULUM VITAE

## ADOLFO SPEGHINI

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## RESEARCH INTERESTS

Nanomaterials activated with luminescent lanthanide ions  
Hybrid organic-inorganic nanostructures  
Multifunctional nanomaterials for biotechnology and nanomedicine  
Optical nanothermometry  
Surface functionalization of inorganic nanoparticles  
Nanoparticle-biomolecule interactions  
Colloidal chemistry  
Nanostructures for drug delivery

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## EDUCATION AND PROFESSIONAL EXPERIENCE

2006 – Associate Professor, Inorganic Chemistry, University of Verona, Verona, Italy  
2001 – 2004 Member of the Board of Directors of the University of Verona, Italy.  
1997 – 2006 Researcher, Inorganic Chemistry, University of Verona, Verona, Italy  
1994 – 1996 Postdoctoral fellowship, Chemical Sciences, University of Verona, Verona, Italy  
1990 – 1992 PhD in Chemistry, University of Padova, Padova, Italy  
1984 – 1988 Master Degree in Chemistry (Summa cum Laude), University of Padova, Padova, Italy

2013 – 2018 Departmental Responsible for Student Orientation  
2012 – Association agreement with the Institute of Applied Physics “Nello Carrara”, Italian National Research Council, Florence, Italy  
2012 – Member of the Board of Directors of the Science and Technology of Materials Italian Consortium, Florence, Italy  
2012 – 2018 Chairman of the Academic Board of the PhD Course “Nanotechnology and Nanomaterials for Biomedical Applications”, University of Verona, Italy  
2012 – 2014 Member of the Board of Directors of the Veneto Interuniversity Consortium for Nanotechnology, Venezia, Italy.

## ITALIAN NATIONAL SCIENTIFIC HABILITATION

2017 Full Professor of Physical Chemistry  
2013 Full Professor of Inorganic Chemistry

## TEACHING ACTIVITIES

- 2017- *Physical Chemistry* (6 CFU), Bachelor's degree in Biotechnology, University of Verona (Verona, Italy)
- 2014 – 2018 *Chemistry of Nanomaterials* (6 CFU), Master's Degree in Science and Technology of Bio and Nanomaterials, University of Verona (Verona, Italy) and Ca' Foscari University of Venice (Venice, Italy)
- 2001 – *General and Inorganic Chemistry* (9 CFU), Bachelor's degree in Viticultural and Oenological Science and Technology, University of Verona (Verona, Italy)
- 2000 – 2003 *Analytical Chemistry*, Master's Degree in Biotechnology, University of Verona (Verona, Italy)

## ORGANIZATION OF INTERNATIONAL CONFERENCES

- 2006 (August) Fourth Italian-Korean Joint Meeting on Inorganic Chemistry (KIMIC IV), Malcesine, Verona, Italy (organizing committee member).
- 2012 (August) 8<sup>th</sup> International Conference on f-Elements (ICFE8), Udine, Italy (organizing committee member).
- 2015 (August) XXIII International Materials Research Congress, Symposium 6E. Luminescent Materials: Basic Phenomena and Applications (in Celebration of the International Year of Light), Cancun, Mexico (chair).

## VISITING SCIENTIST (last 10 years)

- 2013 (October), 2015 (October), 2016 (May), 2017 (August and October) – Université du Québec, Institut National de la Recherche Scientifique – Énergie, Matériaux et Télécommunications (INRS-EMT) (Varenes, QC, Canada). Host: Prof. Fiorenzo Vetrone.
- 2013 (September), 2014 (July), 2015 (August), 2017 (September), 2018 (September) – Humboldt-Universität zu Berlin, Berlin, Germany. Host: Prof. Nicola Pinna (Teaching Staff Mobility).
- 2012 (May), 2014 (August), 2015 (August)- Universidad Autonoma Metropolitana, Mexico City, Mexico. Host: Prof. Ulises Caldino.
- 2011 (November) - Munster University, Germany. Host: Prof. Luisa De Cola.
- 2007 (June), 2010 (April), 2011 (October) - Universidad Autonoma de Madrid, Madrid, Spain. Host: Prof. José Garcia Solé.
- 2007 (September), 2008 (October), 2009 (September), 2010 (September) - Institute of Low Temperatures and Structural Research, Polish Academy of Sciences, Wroclaw, Poland. Host: Prof. Wieslaw Streck.
- 2007 (May, October), 2008 (November), 2009 (May, June) - Concordia University, Montreal, Canada. Host: Prof. John Capobianco.

## VISITING PROFESSOR

- 2012 (November) Université du Québec, Institut National de la Recherche Scientifique – Énergie, Matériaux et Télécommunications (INRS-EMT) (Varenes, QC, Canada). Host: Prof. Fiorenzo Vetrone.

## INTERNATIONAL REVIEWER ACTIVITY

### RESEARCH PROJECTS

- 2018 Evaluation of research proposals, *ERC Advanced Grant 2017*, European Research Council (ERC), EU
- 2018 Evaluation of research proposals, *Executive Government Agency of National Science Centre*, Krakow, Poland

- 2017 Evaluation of research proposals, *ETH Zurich Research Commission*, Zurich, Switzerland
- 2016 Member of the Evaluation Panel (Engineering and Technology) of research projects, *Fundação para a Ciência e a Tecnologia, I. P. (FCT)*, Portuguese Ministry of Science and Education, Lisbon, Portugal.
- 2016 Evaluation of research proposals: "Exploratory Research Projects", *UEFISCDI Evaluation Process, Romanian Executive Agency for Higher Education, Research, Development and Innovation Funding*, Bucharest, Romania
- 2015 Evaluation of funding proposals, *Canada Foundation for Innovation - Fondation canadienne pour l'innovation*, Ottawa, Canada.
- 2015 Evaluation of research proposals, *Executive Government Agency of National Science Centre*, Krakow, Poland.
- 2014 Evaluation of funding proposals (FIR2014) of the University of Catania, Italy.
- 2013 Evaluation of research proposals, *Research Grants Council*, Hong Kong, China.
- 2013 Evaluation of research projects Futuro in Ricerca 2013, *Italian Ministry of Instruction, University and Research*, Italy.
- 2012 Member of the Evaluation Panel (Physics) of research projects, *Executive Agency for Higher Education, Research, Development and Innovation Funding*, Bucarest, Romania.
- 2010 Evaluation of research projects FIRB (Futuro in Ricerca), *Italian Ministry of Instruction, University and Research*, Italy.
- 2010 Evaluation of a postdoctoral research proposal, *Estonian Science Foundation*, Estonia.

## **JOURNALS (selected)**

### **American Chemical Society**

ACS Nano, ACS Applied Materials & Interfaces, ACS Biomaterials Science & Engineering, ACS Photonics, Biomacromolecules, Chemical Reviews, Chemistry of Materials, Crystal Growth & Design, Inorganic Chemistry, Journal of Physical Chemistry, Journal of the American Chemical Society, Langmuir, ACS Omega

### **Royal Society of Chemistry**

Chemistry Communications, CrystEngComm, Dalton Transactions, Inorganic Chemistry Frontiers, Journal of Materials Chemistry, Nanoscale, Physical Chemistry Chemical Physics, RSC Advances, Materials Horizons

### **Elsevier**

Advances in Colloid and Interface Science, Applied Surface Science, Biomaterials, Biosensors and Bioelectronics, Ceramics International, NanoToday, Journal of Luminescence, Journal of Solid State Chemistry, Optical Materials, Materials Chemistry and Physics, Sensors & Actuators: B. Chemical

### **Springer**

Applied Nanoscience, Applied Physics A: Materials Science & Processing, Applied Physics B: Lasers and Optics, Nanoscale Research Letters.

### **Wiley - ChemPubSoc**

Advanced Functional Materials, Advanced Materials, Chemistry – A European Journal, Chemistry - An Asian Journal, ChemPhysChem, ChemistrySelect, European Journal of Inorganic Chemistry

## EDITORIAL BOARD

- 2018 - IET Nanobiotechnology, IET Digital Library (Associate Editor)
- 2017 – Advances in Materials Science and Engineering, Hindawi Publishing Corporation
- 2015 – Journal of Nanomaterials, Hindawi Publishing Corporation
- 2013 – Journal of Nanoparticle Research, Springer Science (Associate Editor)

## RESEARCH PROJECTS

- 2018- Grant, European Social Fund: *Piezoelectric polymeric nanocomposites for electric energy generation from movement* (coordinator).
- 2018- Grant, European Social Fund: Grant, European Social Fund: *Shielding polymeric tissues for low frequency electromagnetic radiations* (coordinator).
- 2017-2018 Grant, European Social Fund: *Quantum Dots activated innovative photovoltaic panels* (coordinator).
- 2017-2018 Grant, European Social Fund: *Thermoelectric energy generation by thermoinsulating panels* (coordinator).
- 2016 - 2017 Grant from the European Social Fund: *Development of innovative tissues for shielding of Low Frequency Electromagnetic Waves* (coordinator).
- 2016 - Grant from the University of Verona, Basic Scientific Research: *NewMaNT, New Materials for Nanothermometry* (coordinator).
- 2016 - European Project, Horizon 2020, SOLSA - *Sonic Drilling coupled with Automated Mineralogy and chemistry On-Line-On-Mine-Real-Time* (participant).
- 2016 - Project of Italian Ministry of Foreign Affairs and International Cooperation selected within the frame of the Executive Program of Scientific and Technological Cooperation between the Italian Republic and the Republic of Poland: *Development of fluoride based nanoparticles doped with Nd<sup>3+</sup> ions and co-doped with Nd<sup>3+</sup>, Yb<sup>3+</sup> in colloidal form as noncontact luminescence nanothermometers*, (Italian Coordinator).
- 2014 - 2016 Joint Project, University of Verona and the company "Fabbrica Cooperativa Perfosfati Cerea", Cerea, Verona, Italy: *Nanostructured material as fertilizers: effect of iron phosphates and carbon dots on plant growth and nutrition*, 2014-2016 (WP leader).
- 2012 - 2014 Project in the framework of the agreement between the Italian National Research Council and Mexican Research Council: *Frequency conversion in oxide glasses and amorphous materials*
- 2011 - 2013 Joint Project, University of Verona and the company "Performance in Lighting s.r.l.", Colognola ai Colli, Verona, Italy: *Development of luminescent nanocomposites activated with lanthanide ions for multicolor light emission upon excitation with Light Emitting Diodes (LED) in the UV or blue region* (coordinator).
- 2010 - 2014 Verona Nanomedicine project, financed by Fondazione Cariverona, Verona, Italy (participant).
- 2010 - 2012 Bilateral project in the framework of scientific and technological cooperation between Italy and Poland of the Italian National Research Council: *Thin films of rare-earth compounds as luminescent concentrators for the improvement of the conversion efficiency of solar cells* (participant).
- 2010 - 2011 Joint research projects within the executive program of cooperation in the field of science and technology between Japan and Italy of the Italian Foreign Affairs Ministry: *Nano-scale chemistry and mechanics in advanced inorganic materials* (participant).
- 2010 Grant from the European Social Fund: *Advanced nanocrystalline materials for nanomedicine applications: synthesis, structural and morphological characterization* (coordinator).

- 2009 – 2011 Project in the framework of the agreement between the Italian National Research Council and Mexican National Science and Technology Council: *White light generation in nanocrystalline oxides activated with metallic ions* (participant).
- 2009 Grant from the European Social Fund: *New nanocrystalline materials for biomedical applications* (coordinator).
- 2008 Italian Ministry of the Instruction, University and Research Fellowship for young Indian Researchers, *Nanotechnology* (supervisor).
- 2007 – 2010 FP6 European Project NMP3-CT-2006-032636, *STRING "Structured Scintillators for Medical Imaging"* (participant).
- 2007 – 2009 Bilateral project in the framework of scientific and technological cooperation between Italy and Poland of the Italian National Research Council: *Preparation and luminescence studies of doped nanostructures of non-linear optical materials* (participant).
- 2004 – 2006 Italy-Poland bilateral project for scientific and technological collaboration of the Italian Foreign Affairs Ministry: *Synthesis and investigations of physicochemical properties of ferroelectric nanostructures doped with rare-earth ions* (participant).
- 1997-2007 Participation to 5 Projects of National Interest, Italian Ministry of University (Subject: lanthanide doped bulk and nanocrystalline materials)

#### **POSTDOCS AND STUDENTS SUPERVISION**

- 9 BD students (Chemistry and Biotechnology)
- 8 MD students (Biotechnology, Science and Technology of Bio- and Nanomaterials)
- 6 PhD students (Biotechnology, Nanotechnology and Nanomaterials for Biomedical Applications, Nanoscience and Advanced Technologies)
- 10 postdocs (Chemistry)

#### **RESEARCH ACTIVITY (IN BRIEF)**

The research activity has been devoted to the synthesis, structural, vibrational and spectroscopic properties of bulk (crystalline and glasses) as well as nanostructured materials, with particular attention to the luminescence properties of transition metal and lanthanide ions doped materials.

Recently, the research has been focused on investigation of multifunctional inorganic based nanomaterials, as optical and magnetic resonance imaging (MRI) contrast agents and nanothermometers for biotechnology and biomedical applications.

#### **PUBLICATIONS**

WoS: # 309 in Chemistry, Physics and Nanoscience  
 WoS: > 9,500 total citations; h-index: 48  
 Google Scholar: > 11,100 " h-index: 53

#### **PATENT**

G. Ciuffreda, D. Segà, Z. Varanini, A. Zamboni, A. Speghini, (2018) "Processo, e relativo impianto, per l'ottenimento di nanoparticelle di fosfati contenenti nutrienti minerali essenziali per la nutrizione delle piante", P2850IT00

#### **COLLABORATIONS**

Prof. Fiorenzo Vetrone, Institut National de la Recherche Scientifique, Université du Québec, Varennes, Canada.

Prof. José Garcia Solè and Prof. Daniel Jaque, Departamento Física de Materiales, Universidad Autónoma de Madrid, Madrid, Spain.

Prof. Dariusz Hreniak, Institute of Low Temperatures and Structure Research, Polish Academy of Sciences, Wrocław, Poland.

### INVITED TALKS/LECTURES

- 2018, July Asian Conference on Nanoscience and Nanotechnology (AsiaNANO2018), Qingdao, China (Keynote).
- 2018, July International Conference on Energy, Materials and Photonics, EMP18, Montreal, Canada.
- 2017, October Invited Talk "Lanthanide activated alkaline-earth fluoride nanoparticles: biocompatible and multifunctional materials for nanomedicine", National Institute of Scientific Research (INRS), University of Quebec, Varennes, Canada.
- 2017, August 7th International Conference on Nanoscience and Technology (ChinaNANO 2017), Beijing, China (Keynote).
- 2016, October Materials Science & Technology 2016 (MS&T16) Conference, Symposium on "Nanomaterials Working in the Near-Infrared: Biomedical Applications", Salt Lake City, Utah, USA.
- 2016, June 6<sup>th</sup> International Workshop on Photoluminescence in Rare-Earths: Photonic Materials and Devices (PRE'16), Greenville, South Carolina, USA.
- 2016, May Emerging Technologies: Communications, Microsystems, Optoelectronics, Sensors (ETCMOS) Conference, Montreal, Canada.
- 2014, August Symposium on "Lanthanide-Doped Materials", International Materials Research Congress (IMRC), Cancun, Mexico.
- 2014, June 1st International Conference on "Fluorescent Up-converting Nanoparticles: a Platform for Energy and Biological Applications" (FUN-BIOENERGY), Torremolinos, Spain.
- 2013, October Materials Science & Technology 2013 (MS&T13) Conference, Symposium on "Optical Nanomaterials for Photonics/Biophotonics", Montreal, Canada.
- 2013, May XIII<sup>th</sup> International Krutyn Summer School 2013 - "Advanced photo- and electrically active molecular and nano-materials at the interface with living systems: challenges and promises for the future bio-medicine" , Krutyn, Poland.

### SELECTED PUBLICATIONS (in NANOMATERIALS)

#### BOOK CHAPTERS

A. Speghini, M. Pedroni, N. Zaccheroni and E. Rampazzo, *Synthesis of upconverting nanomaterials: Designing the composition and the nanostructure*, in *Upconverting Nanomaterials*, C. Altavilla Ed., CRC Press, Taylor & Francis Group, Boca Raton, FL, USA, **2016**, pp. 37-68.

#### ARTICLES

- (1) Dal Cortivo, G.; Wagner, G. E.; Cortelletti, P.; Das, K. M. P.; Zangger, K.; Speghini, A.; Dell'Orco, D.; Meyer, N. H. Luminescent and Paramagnetic Properties of Nanoparticles Shed Light on Their Interactions with Proteins. *Sci. Rep.* **2018**, *8*.
- (2) Cortelletti, P.; Skripka, A.; Facciotti, C.; Pedroni, M.; Caputo, G.; Pinna, N.; Quintanilla, M.; Benayas, A.; Vetrone, F.; Speghini, A. Tuning the Sensitivity of Lanthanide-Activated NIR Nanothermometers in the Biological Windows. *Nanoscale* **2018**, *10* (5), 2568–2576.
- (3) Cortelletti, P.; Pedroni, M.; Boschi, F.; Pin, S.; Ghigna, P.; Canton, P.; Vetrone, F.; Speghini, A. Luminescence of Eu<sup>3+</sup> Activated CaF<sub>2</sub> and SrF<sub>2</sub> Nanoparticles: Effect of

- the Particle Size and Codoping with Alkaline Ions. *Cryst. Growth Des.* **2018**, *18* (2), 686–694.
- (4) Srivastava, A. K.; Singh, A. K.; Kumari, N.; Yadav, R.; Gulino, A.; Speghini, A.; Nagarajan, R.; Mishra, L. Pyridyl Substituted 4-(1,3-Dioxo-1H,3H-Benzo[de]isoquinolin-2-Ylmethyl)-Benzamides with Aggregation Enhanced Emission and Multi-Stimuli-Responsive Properties. *J. Lumin.* **2017**, *182*.
  - (5) Pellegrino, A. L.; Cortelletti, P.; Pedroni, M.; Speghini, A.; Malandrino, G. Nanostructured CaF<sub>2</sub>:Ln<sup>3+</sup> (Ln<sup>3+</sup> = Yb<sup>3+</sup>/Er<sup>3+</sup>, Yb<sup>3+</sup>/Tm<sup>3+</sup>) Thin Films: MOCVD Fabrication and Their Upconversion Properties. *Adv. Mater. Interfaces* **2017**, 1700245.
  - (6) Pedroni, M.; Cortelletti, P.; Cantarelli, I. X.; Pinna, N.; Canton, P.; Quintanilla, M.; Vetrone, F.; Speghini, A. Colloidal Nanothermometers Based on Neodymium Doped Alkaline-Earth Fluorides in the First and Second Biological Windows. *Sensors Actuators, B Chem.* **2017**, *250*, 147–155.
  - (7) Morgese, G.; Dolcet, P.; Feis, A.; Gellini, C.; Gialanella, S.; Speghini, A.; Badocco, D.; Pastore, P.; Casarin, M.; Gross, S. Room-Temperature Crystallization of CuS Nanostructures for Photothermal Applications through a Nanoreactor Approach. *Eur. J. Inorg. Chem.* **2017**, 2017 (20).
  - (8) Labrador-Paez, L.; Pedroni, M.; Smits, K.; Speghini, A.; Jaque, F.; Garcia-Sole, J.; Jaque, D.; Haro-Gonzalez, P. Core-Shell Engineering to Enhance the Spectral Stability of Heterogeneous Luminescent Nanofluids. *Part. Part. Syst. Charact.* **2017**, *34* (12).
  - (9) Cortelletti, P.; Facciotti, C.; Cantarelli, I. X.; Canton, P.; Quintanilla, M.; Vetrone, F.; Speghini, A.; Pedroni, M. Nd<sup>3+</sup> Activated CaF<sub>2</sub> NPs as Colloidal Nanothermometers in the Biological Window. *Opt. Mater. (Amst)*. **2017**, *68*, 29–34.
  - (10) Catalano, M. R.; Pellegrino, A. L.; Rossi, P.; Paoli, P.; Cortelletti, P.; Pedroni, M.; Speghini, A.; Malandrino, G. Upconverting Er<sup>3+</sup>, Yb<sup>3+</sup> Activated Beta-NaYF<sub>4</sub> Thin Films: A Solution Route Using a Novel Sodium Beta-Diketonate Polyether Adduct. *New J. Chem.* **2017**, *41* (12), 4771–4775.
  - (11) Zanzoni, S.; Pedroni, M.; D’Onofrio, M.; Speghini, A.; Assfalg, M. Paramagnetic Nanoparticles Leave Their Mark on Nuclear Spins of Transiently Adsorbed Proteins. *J. Am. Chem. Soc.* **2016**, *138* (1).
  - (12) Portioli, C.; Pedroni, M.; Benati, D.; Donini, M.; Bonafede, R.; Mariotti, R.; Perbellini, L.; Cerpelloni, M.; Dusi, S.; Speghini, A.; et al. Citrate-Stabilized Lanthanide-Doped Nanoparticles: Brain Penetration and Interaction with Immune Cells and Neurons. *Nanomedicine Nanotechnology, Biol. Med.* **2016**, *11* (23).
  - (13) Marciniak, L.; Hreniak, D.; Streck, W.; Piccinelli, F.; Speghini, A.; Bettinelli, M.; Miritello, M.; Lo Savio, R.; Cardile, R.; Priolo, F. Spectroscopic and Structural Properties of Polycrystalline Y<sub>2</sub>Si<sub>2</sub>O<sub>7</sub> Doped with Er<sup>3+</sup>. *J. Lumin.* **2016**, *170*, 614–618.
  - (14) Zanzoni, S.; Assfalg, M.; Singh, R. K.; Pedroni, M.; Speghini, A.; Fushman, D.; D’Onofrio, M. Ubiquitin-Nanoparticle Interactions by Solution NMR Spectroscopy. *Protein Sci.* **2015**, *24*, 25.
  - (15) Villa, I.; Vedda, A.; Cantarelli, I. X.; Pedroni, M.; Piccinelli, F.; Bettinelli, M.; Speghini, A.; Quintanilla, M.; Vetrone, F.; Rocha, U.; et al. 1.3 Mm Emitting SrF<sub>2</sub>:Nd<sup>3+</sup> Nanoparticles for High Contrast in Vivo Imaging in the Second Biological Window. *Nano Res.* **2015**, *8* (2), 649–665.
  - (16) Smecca, E.; Tudisco, C.; Giuffrida, A. E.; Catalano, M. R.; Speghini, A.; Malandrino, G.; Condorelli, G. G. Spatially Confined Functionalization of Transparent NiO Thin Films with a Luminescent (1,10-Phenanthroline)tris(2-Thenoyltrifluoroacetato)europium Monolayer. *Eur. J. Inorg. Chem.* **2015**, 2015 (7).
  - (17) Rodriguez-Sevilla, P.; Rodriguez-Rodriguez, H.; Pedroni, M.; Speghini, A.; Bettinelli, M.; Sole, J. G.; Jaque, D.; Haro-Gonzalez, P. Assessing Single Upconverting Nanoparticle Luminescence by Optical Tweezers. *Nano Lett.* **2015**, *15* (8), 5068–5074.

- (18) Rodríguez-Rodríguez, H.; Sevilla, P. R.; Rodríguez, E. M.; Ortgies, D. H.; Pedroni, M.; Speghini, A.; Bettinelli, M.; Jaque, D.; Haro-Gonzalez, P. Enhancing Optical Forces on Fluorescent Up-Converting Nanoparticles by Surface Charge Tailoring. *Small* **2015**, *11* (13), 1555–1561.
- (19) Prodi, L.; Rampazzo, E.; Rastrelli, F.; Speghini, A.; Zaccheroni, N. Imaging Agents Based on Lanthanide Doped Nanoparticles. *Chem. Soc. Rev.* **2015**, *44* (14), 4922–4952.
- (20) Millesi, S.; Lo Nigro, R.; Pedroni, M.; Speghini, A.; Gulino, A. Photoexcited Porphyrins Functionalizing TiO<sub>2</sub> and SnO<sub>2</sub> Nanocrystals. *J. Phys. Chem. C* **2015**, *119* (41), 23743–23751.
- (21) Meza-Rocha, A. N.; Huerta, E. F.; Caldiño, U.; Carmona-Téllez, S.; Bettinelli, M.; Speghini, A.; Pelli, S.; Righini, G. C.; Falcony, C. Dependence of the up-Conversion Emission of Li<sup>+</sup> Co-Doped Y<sub>2</sub>O<sub>3</sub>:Er<sup>3+</sup> Films with Dopant Concentration. *J. Lumin.* **2015**, *167*, 352–359.
- (22) Dolcet, P.; Maurizio, C.; Casarin, M.; Pandolfo, L.; Gialanella, S.; Badocco, D.; Pastore, P.; Speghini, A.; Gross, S. An Effective Two-Emulsion Approach to the Synthesis of Doped ZnS Crystalline Nanostructures. *Eur. J. Inorg. Chem.* **2015**, *2015* (4), 706–714.
- (23) Dolcet, P.; Mambrini, A.; Pedroni, M.; Speghini, A.; Gialanella, S.; Casarin, M.; Gross, S. Room Temperature Crystallization of Highly Luminescent Lanthanide-Doped CaF<sub>2</sub> in Nanosized Droplets: First Example of the Synthesis of Metal Halogenide in Miniemulsion with Effective Doping and Size Control. *RSC Adv.* **2015**, *5* (21), 16302–16310.
- (24) Del Rosal, B.; Pérez-Delgado, A.; Misiak, M.; Bednarkiewicz, A.; Vanetsev, A. S.; Orlovskii, Y.; Jovanović, D. J.; Dramićanin, M. D.; Rocha, U.; Upendra Kumar, K.; et al. Neodymium-Doped Nanoparticles for Infrared Fluorescence Bioimaging: The Role of the Host. *J. Appl. Phys.* **2015**, *118* (14).
- (25) Quintanilla, M.; Cantarelli, I. X. X.; Pedroni, M.; Speghini, A.; Vetrone, F. Intense Ultraviolet Upconversion in Water Dispersible SrF<sub>2</sub>:Tm<sup>3+</sup>,Yb<sup>3+</sup>nanoparticles: The Effect of the Environment on Light Emissions. *J. Mater. Chem. C* **2015**, *3* (13), 3108–3113.
- (26) Leto, A.; Piccinelli, F.; Pezzotti, G.; Speghini, A.; Nodari, L.; Polizzi, S.; Bettinelli, M. Single Crystal and Nanocrystalline Pr<sup>3+</sup> Doped LuPO<sub>4</sub>: Synthesis, Structural Characterization, Photo- and Cathodoluminescence. *Mater. Res. Bull.* **2014**, *51*, 24–27.
- (27) Cantarelli, I. X.; Pedroni, M.; Piccinelli, F.; Marzola, P.; Boschi, F.; Conti, G.; Sbarbati, A.; Bernardi, P.; Mosconi, E.; Perbellini, L.; et al. Multifunctional Nanoprobes Based on Upconverting Lanthanide Doped CaF<sub>2</sub>: Towards Biocompatible Materials for Biomedical Imaging. *Biomater. Sci.* **2014**, *2* (9), 1158–1171.
- (28) Butturini, E.; Dolcet, P.; Casarin, M.; Speghini, A.; Pedroni, M.; Benetti, F.; Motta, A.; Badocco, D.; Pastore, P.; Diodati, S.; et al. Simple, Common but Functional: Biocompatible and Luminescent Rare-Earth Doped Magnesium and Calcium Hydroxides from Miniemulsion. *J. Mater. Chem. B* **2014**, *20* (38).
- (29) Barrera, E. W.; Pujol, M. C.; Carvajal, J. J.; Mateos, X.; Solé, R.; Massons, J.; Speghini, A.; Bettinelli, M.; Cascales, C.; Aguiló, M.; et al. Upconversion Emission in (Ln,Yb):KLu(WO<sub>4</sub>)<sub>2</sub> Nanocrystals for White Light Generation. *J. Phys. Conf. Ser.* **2014**, *480* (1).
- (30) Barrera, E. W.; Pujol, M. C.; Carvajal, J. J.; Mateos, X.; Solé, R.; Massons, J.; Speghini, A.; Bettinelli, M.; Cascales, C.; Aguiló, M.; et al. White Light Upconversion in Yb-Sensitized (Tm, Ho)-Doped KLu(WO<sub>4</sub>)<sub>2</sub> Nanocrystals: The Effect of Eu Incorporation. *Phys. Chem. Chem. Phys.* **2014**, *16* (4), 1679–1686.
- (31) Whiffen, R. M. K.; Antic, Z.; Speghini, A.; Brik, M. G.; Bartova, B.; Bettinelli, M.; Dramicanin, M. D. Structural and Spectroscopic Studies of Eu<sup>3+</sup> Doped Lu<sub>2</sub>O<sub>3</sub>-Gd<sub>2</sub>O<sub>3</sub> Solid Solutions. *Opt. Mater. (Amst).* **2014**, *36* (6), 1083–1091.



- (32) Simunekova, M.; Prodius, D.; Mereacre, V.; Schwendt, P.; Turta, C.; Bettinelli, M.; Speghini, A.; Lan, Y. H.; Anson, C. E.; Powell, A. K. Tetradecanuclear Lanthanide-Vanadium “nanochocolates”: Catalytically-Active Cationic Heteropolyoxovanadium Clusters. *Rsc Adv.* **2013**, 3 (18), 6299–6304.
- (33) Pedroni, M.; Piccinelli, F.; Passuello, T.; Polizzi, S.; Ueda, J.; Haro-Gonzalez, P.; Maestro, L. M.; Jaque, D.; Garcia-Sole, J.; Bettinelli, M.; et al. Water (H<sub>2</sub>O and D<sub>2</sub>O) Dispersible NIR-to-NIR Upconverting Yb<sup>3+</sup>/Tm<sup>3+</sup> Doped MF<sub>2</sub> (M = Ca, Sr) Colloids: Influence of the Host Crystal. *Cryst. Growth Des.* **2013**, 13 (11), 4906–4913.
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