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# **10<sup>th</sup> International Symposium on Nitrides**



**Casa Convalescència, Barcelona, Spain  
June 9<sup>th</sup>-13<sup>th</sup> 2019**

## Overview Program

Sunday 9/6/2019	Monday 10/6/2019	Tuesday 11/6/2019	Wednesday 12/6/2019	Thursday 13/6/2019
	8:00-9:00 <b>Registration</b>	9:00-10:30	9:00-10:30	9:00-13:00  <b>Conference Tour: Modernist Barcelona</b>
	9:00-9:15 <b>Opening Address</b>	Session 4 <b><u>Crystal Chemistry-1</u></b>	Session 8 <b><u>Thin Films</u></b>	
	9:15-10:25 <b>Session 1</b> <b><u>Synthetic Approaches-1</u></b>			
	10:25-11:00 Coffee break	10:30-11:00 Coffee break	10:30-11:00 Coffee break	
	11:00-12:30 <b>Session 2</b> <b><u>Synthetic Approaches-2</u></b>	11:00-12:30 <b>Session 5</b> <b><u>Crystal Chemistry-2</u></b>	11:00-12:10 <b>Session 9</b> <b><u>Silicon Nitride</u></b>	
	12:30-14:00 Lunch break	12:30-14:00 Lunch break	12:30-14:00 Lunch break	
	14:00-15:35 <b>Session 3</b> <b><u>Special Session Young Researchers</u></b>	14:00-15:30 <b>Session 6</b> <b><u>Functional (oxy)nitrides: Catalytic properties</u></b>	14:00-16:00 <b>Session 10</b> <b><u>Carbon Nitrides</u></b>	
	15:35-16:05 Coffee break	15:30-16:00 Coffee break	16:00-16:15 Closing Remarks 16:15-16:45 Coffee break	
	16:05-17:35 <b><u>Poster Session</u></b>	16:00-17:20 <b>Session 7</b> <b><u>Functional (oxy)nitrides: Electronic properties</u></b>		
17:00-18:00 <b>Registration</b> 18:00-20:00 <b>Welcome Reception</b> <b>Casa Convalescència</b>			20:00-22:30 <b>Conference Dinner</b> <b>Restaurant 1881</b>	

## Program

### Sunday, June 9th

17:00-18:00 Registration, Casa Convalescència

18:00-20:00 Welcome Reception, Casa Convalescència

### Monday, June 10th

8:00-9:00 Registration

9:00-9:15 Opening Address: Amparo Fuertes-Ralf Riedel

#### Session 1: Synthetic Approaches-1

**Chairperson: Ralf Riedel**

9:15-9:45 IL01 Duncan Gregory, University of Glasgow, United Kingdom.  
“Energy storage with N-H bonds; nitrides, amides, ammoniates and others”

9:45-10:05 CL01 Franck Tessier, University of Rennes-CNRS, France.  
“Original precursors leading to nanostructured transition metal nitrides”

10:05-10:25 CL02 Shinichi Kikkawa, Hokkaido University, Japan.  
“Intergrowth between the oxynitride perovskite  $\text{SrTaO}_2\text{N}$  and a Ruddlesden-Popper phase  $\text{Sr}_2\text{TaO}_3\text{N}$ ”

10:25-11:00

**Coffee Break**

#### Session 2: Synthetic Approaches-2

**Chairperson: Amparo Fuertes**

11:00-11:30 IL02 Ken Niwa, Nagoya University, Japan.  
“High-pressure synthetic approach to novel binary nitrides”

11:30-11:50 CL03 Shrikant Bhat, Deutsches Elektronen-Synchrotron DESY, Germany.  
“High-pressure synthesis of a novel tin oxynitride  $\text{Sn}_2\text{N}_2\text{O}$  (SNO)”

11:50-12:10 CL04 Ralf Riedel, Technische Universität Darmstadt, Germany.  
“Single-source-precursor synthesis and high-temperature evolution of novel mesoporous  $\text{VN/Si}_3\text{N}_4$  ceramic nanocomposites”

12:10-12:30 CL05 Peter Höhn, Max Planck Institute for Chemical Physics of Solids, Germany.  
“Structural complexity by 2D intergrowth in nitridomanganates”

12:30-14:00

**Lunch Break**

### Session 3: Special Session Young Researchers

#### Chairperson: Laurent Le Gendre

- 14:00-14:20 CL06 Sebastian Vogel, University of Munich (LMU), Germany.  
“Accessing mixed non-metal nitrides via an innovative high-pressure high-temperature reaction”
- 14:20-14:40 CL07 Sarah O’Sullivan, University of Sheffield, United Kingdom.  
“Ammonolysis of uranium oxides”
- 14:40-15:00 CL08 Mateus Lenz Leite, University of Bayreuth, Germany.  
“Synthesis of yttrium silicates from yttrium oxide and an oligosilazane by the PDC route for application as EBCs to protect Si<sub>3</sub>N<sub>4</sub> in hot gas environments”
- 15:00-15:20 CL09 Erwan Leysour de Rohello, University of Rennes-CNRS, France.  
“Alkaline-earth carbodiimides as new potential phosphors for white LEDs”

### Student Poster Flash Presentations

- 15:20-15:25 P02 Mathias Mallmann, University Munich (LMU), Germany.  
“Ammonothermal synthesis of solid solutions of ternary nitride semiconductors II-IV-N<sub>2</sub> (II = Mg, Mn, Zn; IV = Si, Ge)”
- 15:25-15:30 P03 Kévin Guy, University of Rennes-CNRS, France.  
“Synthesis of molybdenum nitrides starting from transition metal cluster compounds”
- 15:30-15:35 P04 Tobias Gifhthaler, University Munich (LMU), Germany.  
“Nitridoberyllsilicates – promising host materials for solid-state lighting”

15:35-16:05 Coffee Break

16:05-17:35 Poster Session

- P01 Takayoshi Oshima, Tokyo Institute of Technology, Japan.  
“Synthesis of a new oxynitride K<sub>2</sub>LaTa<sub>2</sub>O<sub>6</sub>N with layered perovskite structure and the outstanding photocatalytic performance”
- P02 Mathias Mallmann, University Munich (LMU), Germany.  
“Ammonothermal synthesis of solid solutions of ternary nitride semiconductors II-IV-N<sub>2</sub> (II = Mg, Mn, Zn; IV = Si, Ge)”
- P03 Kévin Guy, University of Rennes-CNRS, France.  
“Synthesis of molybdenum nitrides starting from transition metal cluster compounds”

- P04 Tobias Gifhaler, University of Munich (LMU), Germany  
“Nitridoberyllsilicates – promising host materials for solid-state lighting”
- P05 François Cheviré, University of Rennes-CNRS, France  
“From highly reactive amorphous tantalum oxide to tantalum nitride. Impact of the nitridation temperature on the optical and photocatalytic properties”
- P06 Judith Oró-Solé, Institute of Materials Science of Barcelona (CSIC), Spain.  
“Topochemical nitridation of  $\text{Sr}_2\text{FeMoO}_6$ ”

**Tuesday, June 11<sup>th</sup> 2019**

#### **Session 4: Crystal Chemistry-1**

**Chairperson: Shinichi Kikkawa**

- 9:00-9:30 IL03 Gilles Frapper, University of Poitiers-CNRS, France.  
“Predicting novel nitrides under pressure from evolutionary algorithm and DFT calculations”
- 9:30-9:50 CL10 Masashi Hasegawa, Nagoya University, Japan.  
“Crystal chemistry and physical properties of novel hard tungsten nitride”
- 9:50-10:10 CL11 Yasushi Sato, Okayama University of Science, Japan.  
“Control of excitation energy in  $\text{Pr}^{3+}$ -activated oxide-oxynitride perovskites by bandgap engineering”
- 10:10-10:30 CL12 Xiaojun Kuang, Guilin University of Technology, China.  
“Structure and dielectric permittivity of  $\text{ABN}_2$ -type layered nitride”

10:30-11:00

**Coffee Break**

#### **Session 5: Crystal Chemistry-2**

**Chairperson: Peter Höhn**

- 11:00-11:30 IL04 Yuji Masubuchi, Hokkaido University, Japan.  
“Thermal stability and densification of perovskite-type oxynitride solid solution”
- 11:30-11:50 CL13 Joachim Breternitz, Helmholtz-Zentrum Berlin für Materialien und Energie, Germany.  
“Oxygen in  $\text{ZnGeN}_2$  – a complex structure-property relationship”
- 11:50-12:10 CL14 Hiroshi Kageyama, Kyoto University, Japan.  
“Titanium oxide-nitride: an ammonia synthesis catalyst”
- 12:10-12:30 CL15 Fumitaka Yoshimura, Mitsubishi Chemical Corporation, Japan.  
“Single crystals of  $\text{Sr}(\text{Al},\text{Si})_6\text{N}_8:\text{Eu}$  and  $\text{CaAlSi}_4\text{N}_7:\text{Eu}$  nitride phosphors prepared with magnesium nitride”

12:30-14:00

**Lunch Break**

## Session 6: Functional (oxy)nitrides: Catalytic properties

### Chairperson: Franck Tessier

- 14:00-14:30 IL05 Ryu Abe, Kyoto University, Japan.  
“New mixed anion semiconductor photocatalysts for visible light induced water splitting”
- 14:30-14:50 CL16 Wenjea Tseng, National Chung Hsing University, Taiwan.  
“TiN and TiO<sub>2</sub> composite nanoparticles for organic dye adsorption and photocatalysis”
- 14:50-15:10 CL17 Akinobu Miyoshi, Tokyo Institute of Technology, Japan.  
“Synthesis of nitrogen/fluorine codoped rutile TiO<sub>2</sub> and its photocatalytic activity for water oxidation”
- 15:10-15:30 CL18 Adam Slabon, Stockholm University, Sweden.  
“Core-shell SrTaO<sub>2</sub>N nanowire photoanode for photoelectrochemical water oxidation”

15:30-16:00

Coffee Break

## Session 7 : Functional (oxy)nitrides: Electronic properties

### Chairperson: Hiroshi Kageyama

- 16:00-16:30 IL06 Anke Weidenkaf, Technische Universität Darmstadt, Germany.  
“Perovskite-type oxynitride substitution material”
- 16:30-16:50 CL19 Junichi Tatami, Yokohama National University, Japan.  
“Triboluminescence of AlN:Mn and CaAlSiN<sub>3</sub>:Eu ceramics”
- 16:50-17:20 IL07 Richard Laine, University of Michigan, USA.  
“Polymer precursors to ion conducting glasses (i.e. LiPON) for thin films, adhesives, binders, and sintering aids. Towards all solid-state Li-S batteries”

Wednesday, June 12<sup>th</sup> 2019

**Session 8: Thin Films**

**Chairperson: Yuji Masubuchi**

- 9:00-9:30 IL08 You Zhou, National Institute of Advanced Industrial Science and Technology (AIST), Japan.  
“High-thermal-conductivity silicon nitride substrate materials”
- 9:30-9:50 CL20 Sebastian Zlotnik, Institute of Electronic Materials Technology, Poland.  
“Strategies towards enhanced p-type conductivity in wide bandgap III-nitrides”
- 9:50-10:10 CL21 Claire Le Paven, University of Rennes, France.  
“Influence of the substrate on the structural and photocatalytic properties of oxynitride SrTaO<sub>2</sub>N films”
- 10:10-10:30 CL22 Laurent Le Gendre, University of Rennes, France  
“(Sr,La)-(Ta,Ti)-O-N perovskite oxide and oxynitride films: influence of the deposition and annealing conditions on the structure and electrical properties”

10:30-11:00

**Coffee Break**

**Session 9: Silicon Nitride**

**Chairperson: Walter Lengauer**

- 11:00-11:30 IL09 Samuel Bernard, University of Limoges-CNRS, France.  
“Metal-modified polysilazanes toward silicon nitride-based ceramics for energy applications”
- 11:30-11:50 CL23 Hua-Tay Lin, Guangdong University of Technology, China.  
“Microstructure and tribological behavior of diamond-Si<sub>3</sub>N<sub>4</sub> composites by current-assisted sintering”
- 11:50-12:10 CL24 Zhipeng Xie, Tsinghua University, China.  
“Consolidation of silicon nitride ceramics by oscillatory pressure sintering technique”

12:30-14:00

**Lunch Break**

## Session 10: Carbon Nitrides

**Chairperson: Samuel Bernard**

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| 14:00-14:30 | IL10 | Zhaoju Yu, Xiamen University, China.<br>“SiC-HfCN-based ceramic nanocomposites: molecular synthesis, tailorable microstructure and advanced functional properties”                   |
| 14:30-14:50 | CL25 | Walter Lengauer, Vienna University of Technology, Austria.<br>“3D printing of titanium carbonitride cermets”   |
| 14:50-15:10 | CL26 | Stefania Sandoval, Institute of Materials Science of Barcelona (CSIC), Spain.<br>“Ammonolysis of graphene oxide: from N-functionalization to N-doping”                               |
| 15:10-15:30 | CL27 | Cordula Braun, Karlsruhe Institut of Technology, Germany.<br>“SnCN <sub>2</sub> –A novel main group carbodiimide”  |
| 15:30-16:00 | IL11 | Norimasa Nishiyama, Tokyo Institute of Technology, Japan.<br>“Fabrication of polycrystalline cubic silicon and germanium nitrides under high pressure and their physical properties” |

16:00-16:15

**Closing Remarks**

16:15-16:45

**Coffee Break**

20:00-22:30

**Conference dinner  
Restaurant 1881 at Catalonia History Museum**

**Thursday, June 13<sup>th</sup> 2019**

9:00-13:00

**Conference Tour: Guided Tour to Modernist Barcelona**