



# 11<sup>th</sup> German-French Workshop on Oxide, Dielectric, and Laser Crystals 2022

September 15<sup>th</sup>-16<sup>th</sup>, 2022 - Villeurbanne (France)

organized by



MITI - CNRS network on Crystal Growth Technologies

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# ORAL TALKS

THURSDAY, SEPTEMBER 15<sup>TH</sup>, 2022

- 13:00**      **Registration**
- 13:55**      **Welcome address**  
Philippe Veber<sup>a,b,c</sup>  
<sup>a</sup> CNRS, University Claude Bernard Lyon 1, Institut Lumière Matière, 69100 Villeurbanne, France  
<sup>b</sup> CRISTECH CNRS network, Mission pour les Initiatives Transverses et Interdisciplinaire (MITI), France  
<sup>c</sup> French Committee for Crystal Growth (CFCC), French Association for Crystallography (AFC), France
- 14:00**      **Presentation of CMDO – MITI - CNRS network and French Committee for Crystal Growth (CFCC)**  
Matias Velazquez<sup>a,b,c</sup>  
<sup>a</sup> CNRS, Univ. Grenoble Alpes, Grenoble INP, SIMAP UMR 5266, Saint Martin d'Hères, France  
<sup>b</sup> CMDO CNRS network, Mission pour les Initiatives Transverses et Interdisciplinaire (MITI), France  
<sup>c</sup> French Committee for Crystal Growth (CFCC), French Association for Crystallography (AFC), France
- 14:10**      **INVITED TALK: Crystal growth of functional materials**  
Monica Ciomaga Hatnean<sup>a, b</sup>  
<sup>a</sup> Laboratory for Multiscale materials eXperiments, Paul Scherrer Institute, Forschungsstrasse 111, 5232 Villigen, Switzerland  
<sup>b</sup> Materials Discovery Laboratory, Department of Materials, Swiss Federal Institute of Technology Zürich, 8093 Zürich, Switzerland
- 14:55**      **KNbO<sub>3</sub> and BaTiO<sub>3</sub> crystal growth by TSSG (top-seeded solution growth)**  
Daniel Rytz<sup>a</sup>, Andreas Groß, Christoph Liebald, Sebastian Schwung, Volker Wesemann  
<sup>a</sup> EOT GmbH, Struthstrasse 2, D-55743 Idar-Oberstein, Germany
- 15:15**      **Bulk single crystals of transparent semiconducting oxides**  
Z. Galazka<sup>a</sup>, S. Ganschow, K. Irmscher, D. Klimm, R. Schewski, M. Albrecht, A. Dittmar, T. Schulz, M. Pietsch, A. Kwasniewski, I. M. Hanke, M. Sündermann, T. Schröder, Matthias Bickermann<sup>a,b</sup>  
<sup>a</sup> Leibniz Institute for Crystal Growth (IKZ), Max-Born-Straße 2, 12489 Berlin, Germany  
<sup>b</sup> Technische Universität Berlin, Institute of Chemistry, Straße des 17. Juni 115, 10623 Berlin, Germany
- 15:35**      **Czochralski-grown Tm:YScO<sub>3</sub> for efficient 2 μm lasers**  
Christian Kränkel<sup>a</sup>, A. Suzuki<sup>a,b,c</sup>, H. Tanaka<sup>a</sup>, S. Kalusniak<sup>a</sup>, S. Ganschow<sup>a</sup>, and M. Tokurakawa<sup>b,c</sup>  
<sup>a</sup> Leibniz-Institut für Kristallzüchtung (IKZ), Max-Born-Str. 2, 12489 Berlin, Germany  
<sup>b</sup> Inst. for Laser Science, Univ. of Electro-Communications, 1-5-1 Chofuaoka, Chofu, Tokyo, 182-8585, Japan  
<sup>c</sup> Center for Neuroscience and Biomedical Engineering, University of Electro-Communications, 1-5-1, Chofugaoka, Chofu, 182-8585, Japan
- 15:55**      **Coffee break – Poster session – Face to face discussions**
- 16:35**      **INVITED TALK: Nonlinear optics for frequency conversion and generation of new quantum states of light**  
Benoit Boulanger<sup>a</sup>, P. Segonds<sup>a</sup>, V. Boutou<sup>a</sup>, A. Peña<sup>a</sup>, C. Félix<sup>a</sup>, J. Debray<sup>a</sup>, D. Jegouso<sup>a</sup>  
<sup>a</sup> Université Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, 38000 Grenoble, France



- 17:20**      **Rare earth micro-emitters made by pulsed laser deposition layers: from amorphous to crystalline properties**  
Alban Gasseng<sup>a</sup>, A. Bernard<sup>a</sup>, B. Baguenard<sup>a</sup>, S. Guy<sup>a</sup>, H-S. Nguyen<sup>b</sup>, S. Cueff<sup>b</sup>, Y. Guyot<sup>a</sup>, A. Pereira<sup>a</sup>  
<sup>a</sup> Institut Lumière Matière, UCBL, CNRS, UMR5306, LYON, France  
<sup>b</sup> Institut des Nanotechnologies de Lyon, UMR 5270, ECL, CNRS, INSA, UCBL, 36, LYON, France
- 17:40**      **Direct Bonding of SINGLE crystalline components for application in high power laser systems**  
Carolin Rothhardt<sup>a</sup>, Stefan Risse<sup>a</sup>, Thomas Schreiber<sup>a</sup>, Jan Rothhardt<sup>b,c</sup>, Jens Limpert<sup>a,b,c</sup>, Andreas Tünnermann<sup>a,b,c</sup>  
<sup>a</sup>Fraunhofer Institute of Applied Optics and Precision Engineering, Albert-Einstein Straße 7, 07745 Jena, Germany  
<sup>b</sup>Institute of Applied Physics, Abbe Center of Photonics, Friedrich-Schiller-University Jena, Albert-Einstein-Str. 15, 07745 Jena, Germany  
<sup>c</sup>Helmholtz Institute Jena, Fröbelstieg 3, 07743 Jena, Germany
- 18:00**      **End of the first day**
- 18:10**      **Departure for the center of Lyon by tramway and subway – Short visit**
- 20:00**      **Dinner at « Auberge des Canuts » restaurant in the historic centre of Lyon**

## FRIDAY, SEPTEMBER 16<sup>TH</sup>, 2022

- 8:55**      **Registration – Welcome address**  
Philippe Veber<sup>a,b,c</sup>  
<sup>a</sup> CNRS, University Claude Bernard Lyon 1, Institut Lumière Matière, 69100 Villeurbanne, France  
<sup>b</sup> CRISTECH CNRS network, Mission pour les Initiatives Transverses et Interdisciplinaire (MITI), France  
<sup>c</sup> French Committee for Crystal Growth (CFCC), French Association for Crystallography (AFC), France
- 09:00**      **INVITED TALK: Single crystal based high-temperature piezoelectric transducers**  
Holger Fritze<sup>a</sup>  
<sup>a</sup> Clausthal University of Technology, Institute of Energy Research and Physical Technologies, 38640 Goslar, Germany
- 09:45**      **Influence of Yb<sup>2+</sup> on the quantum efficiency of Yb<sup>3+</sup> in CaF<sub>2</sub>**  
Hiroki Tanaka<sup>a</sup>, S. Püschel, and C. Kränkel  
<sup>a</sup> Leibniz-Institut für Kristallzüchtung (IKZ), Max-Born-Str. 2, 12489 Berlin, Germany
- 10:05**      **Coffee break – Poster session – Face to face discussions**
- 10:35**      **INVITED TALK: Non-linear bulk and waveguide materials for single photon quantum technologies**  
Erik Beckert<sup>a</sup>, Fabian Steinlechner<sup>a</sup>, Sakshi Sharma<sup>a</sup>, Emma Brambila-Tamayo<sup>a</sup>  
<sup>a</sup> Fraunhofer-Institute for Applied Optics and Precision Engineering, Albert-Einstein-Strasse 7, 07745 Jena, Germany
- 11:20**      **Single crystal growth of Yb-doped KY<sub>3</sub>F<sub>10</sub> and LiYF<sub>4</sub> for laser cooling**  
Stefan Püschel<sup>a</sup>, Christian Kränkel, and Hiroki Tanaka  
<sup>a</sup> Leibniz-Institut für Kristallzüchtung (IKZ), Max-Born-Str. 2, 12489 Berlin, Germany

- 11:40**      **Synchrotron micro-diffraction study of Herbertsmithite  $Zn_xCu_{4-x}(OH)_6Cl_2$  single crystals surfaces**  
Vijaya S. Paul Raj<sup>a</sup>, M. Velazquez<sup>a</sup>, A. Peña<sup>b</sup>, J.-S. Micha<sup>c</sup>, R. R. Purohit Purushottam<sup>c</sup>, Vincent Motto-Ros<sup>d</sup>, F. Bert<sup>e</sup>, Philippe Mendels<sup>e</sup>, G. Montes-Hernandez<sup>f</sup>  
<sup>a</sup> Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMAP UMR 5266, 1130 rue de la piscine, 38402 Saint Martin d'Hères, France  
<sup>b</sup> Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, 38000 Grenoble, France  
<sup>c</sup> European Synchrotron Radiation Facility, 71 rue des Martyrs CS 40220, 38043 Grenoble Cedex 9, France  
<sup>d</sup> Université Lyon, Université Claude Bernard Lyon 1, CNRS, ILM UMR 5306, France  
<sup>e</sup> Laboratoire de Physique des Solides, CNRS, Univ. Paris-Sud, Université Paris-Saclay, 91405 Orsay Cedex, France  
<sup>f</sup> Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, IRD, IFSTTAR, ISTERre, 38000 Grenoble, France
- 12:00**      **Workshop closing**
- 12:10**      **Lunch bag distribution for attendees**

## POSTERS

**15H55-16H35 THURSDAY, SEPT. 15<sup>TH</sup> AND 10H05-10H35 FRIDAY, SEPTEMBER 16<sup>TH</sup>, 2022**

- P1**      **CdSiP<sub>2</sub> nonlinear optical crystals for mid-IR high-power ns-pulsed laser sources**  
M. Piotrowski<sup>a</sup>, S. Bigotta<sup>a</sup>, C. Mueller<sup>a</sup>, A. Hildenbrand-Dhollande<sup>a</sup>  
<sup>a</sup> French-German Research Institute, ISL, 5, rue du General Cassagnou, 68301 Saint-Louis, France
- P2**      **CRISTECH-MITI-CNRS network**  
P. Veber<sup>a,b,c</sup>  
<sup>a</sup> CNRS, University Claude Bernard Lyon 1, Institut Lumière Matière, 69100 Villeurbanne, France  
<sup>b</sup> CRISTECH CNRS network, Mission pour les Initiatives Transverses et Interdisciplinaire (MITI), France  
<sup>c</sup> French Committee for Crystal Growth (CFCC), French Association for Crystallography (AFC), France

## SPONSORS

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# 11<sup>th</sup> German-French Workshop on Oxide, Dielectric, and Laser Crystals 2022

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Oxides constitute the most versatile class of inorganic materials, and single crystals provide superior as well as homogeneous properties. Such crystals are used as optical, piezoelectric, or laser materials, and as substrates for piezoelectric and oxide electronic applications. As oxide crystals appear in many crystallographic structures and can be formed from nearly every element in the periodic table, the preparation of novel materials as well as the improvement of their structural quality is key for providing materials with improved or even novel characteristics.

This 11<sup>th</sup> **German-French Workshop on Oxide, Dielectric and Laser single crystal (WODIL)** is a continuation of the DGKK meetings on “Crystals for lasers and NLO” and previous workshops organized at FEE-COHERENT in Idar-Oberstein (2011, 2014, 2018, 2021), ISL in Saint Louis (2012, 2015), IKZ in Berlin (2016, 2020), ICMCB in Bordeaux (2017) and at ILM-UCBL in Villeurbanne (2019).

In 2022, the present workshop WODIL will be held for the second time at the Institute of Light and Matter – University Claude Bernard Lyon 1 (ILM-UCBL1) in Villeurbanne. It is organized by the **CNRS network CRISTECH** (Crystal Growth Technologies) under the aegis of the **French Committee of Crystal Growth (CFCC)** and the **German Society of Crystal Growth (DGKK)**. Moreover, the CNRS network CMDO (Micro-nano-structured crystals and optical devices) is associated to this event.

This workshop brings together scientists and scholars from industry, research labs, and universities to present and discuss the recent advances in the field of oxide crystals, dielectric materials, laser and non-linear optical crystals, solid-state lasers, and related topics.

