28th International Workshop on Electronic Oxides

Program

**Sunday 2\textsuperscript{nd} October 2022**

17h00 Registration

**Monday 3\textsuperscript{rd} October 2022**

08h30 Registration

09h00 Welcome and opening remarks

**Session: Spin and Charge Transfer**
Chair: Jean-Marc Triscone, University of Geneva

09h15 Agnes Bathelemy (Invited Speaker) (Unité Mixte de Physique CNRS/Thales)
*Oxide 2DEG for spin-charge interconversion*

09h45 Yifei Hao (University of Nebraska - Lincoln)
*Interface Charge Engineering in Ferroelectric-Gated Mott Transistors*

10h00 Andrea Peralta Somoza (Universidad Complutense, Spain)
*Large topological Hall effect and spin textures in La_{0.7}Sr_{0.3}MnO_{3} / SrIrO_{3} bilayers*

10h15 Marta Gibert (TU Wien)
*Charge-transfer engineering at polar double-perovskite/perovskite interfaces*

10h30 Kidae Shin (Yale University)
*Optimizing Monolayer Ferroelectric ZrO_{2} on Si (001)*

10h45 Coffee Break

**Session: Quantum Materials**
Chair: Jochen Mannhart, Max Planck Institute Stuttgart

11h00 Stephen Wilson (Invited Speaker) (University of California, Santa Barbara)
*Strange metal states and quantum criticality in doped J_{eff}=1/2 Mott states*

11h30 Alexandru Bogdan Georgescu (Northwestern University)
*Machine-Learning Assisted Quantum Materials Discovery And Optimization: Metal-Insulator Transition Compounds*
11h45 Qi Song (Cornell University)
Growth of PdCoO₂ films with controlled termination by MBE and determination of their electronic structure by ARPES

12h00 Willem Rischau (University of Geneva)
Metal insulator transition in $^{18}$O isotope substituted Vanadium dioxide

12h15 Matthias Opel (Walther-Meissner-Institut, Germany)
Magnon Hanle experiments in antiferromagnetic alpha-Fe₂O₃

12h30 Lunch provided by iWOE Meeting

13h45 **Poster Session A**

**Session: Nickelates/Superconductivity**
Chair: Jennifer Fowlie, Stanford University

15h00 **Julia Mundy** (Invited Speaker) (Harvard University)
Superconductivity in a quintuple-layer square-planar nickelate

15h30 Lin Er Chow (National University of Singapore)
Pauli-limit violation in nickelate: to what extent a high-$T_c$ cuprate analogue?

15h45 **George Sawatzky** (Invited Speaker) (UBC)
The elusive fermi surface and electride like electronic structure of the infinite layer Nickelates

16h15 Kyuho Lee (Stanford University)
Emergent Intrinsic Transport Properties of Infinite-Layer Nickelates

16h30 Marco Salluzzo (CNR-SPIN)
Charge density wave and magnetic excitations in infinite layer nickelates

16h45 **Jean-Marc Triscone** (Invited Speaker) (University of Geneva)
Structural and electronic coupling in transition metal oxide heterostructures

**Tuesday 4th October 2022**

**Session: Ruthenates/Magnetic Materials**
Chair: Chang-Beom Eom, University of Wisconsin-Madison

9h00 **Changyoung Kim** (Invited Speaker) (Seoul National University)
Controlling the electronic structures of atomically thin oxide films: Hund metals and Mott insulators
9h30  Bharat Jalan (University of Minnesota)
Navigating Atomically Precise Synthesis of Stubborn Metal Oxides using Chemistry

9h45  Martina Zupancic (Leibniz-Institut für Kristallzüchtung)
Atomic-scale analysis of the interface between polar and nonpolar LaInO$_3$/BaSnO$_3$ perovskite oxides

10h00 Seung Gyo Jeong (Sungkyunkwan University)
Exotic magnetic anisotropy near dimensional Mott boundary

10h15 Prosper Ngabonziza (Max Planck Institute for Solid State Research, Germany)
Magnetotransport Properties of Epitaxial Sr$_3$Ru$_2$O$_7$-based Heterostructures and Devices

10h30 Coffee Break

**Session: Ferroelectrics**
Chair: Darrell Schlom, Cornell University

11h00 Michele Conroy (Invited Speaker) (Imperial College London)
Charged Higher Order Topologies in Room Temperature Magnetoelectric Multiferroic Thin Film

11h30 Martina Müller (University of Konstanz)
How defects and dopants stabilize ferroelectricity in HfO$_2$ — a spectroscopic approach

11h45 Suraj Cheema (University of California, Berkeley)
Negative Capacitance Electronics via Ultrathin Ferroelectricity in HfO$_2$-ZrO$_2$

12h00 Jon-Paul Maria (Penn State University)
Ferroelectrics Everywhere

12h15 Gertjan Koster (University of Twente)
Signatures of enhanced out-of-plane polarization in asymmetric BaTiO$_3$ superlattices integrated on silicon

12h30 Lunch provided by iWOE Meeting

13h45 **Poster Session B**
### Session: Interfaces/2DEGs
Chair: Guus Rijnders, University of Twente

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>15h00</td>
<td>Michael Norman (Invited Speaker) (Argonne National Laboratory)</td>
<td>Pairing Mediated by the Transverse Optic Mode in KTaO₃</td>
</tr>
<tr>
<td>15h30</td>
<td>Michael Sing (University of Würzburg)</td>
<td>Interface band engineering in LaAlO₃/SrTiO₃ heterostructures</td>
</tr>
<tr>
<td>15h45</td>
<td>Changgan Zeng (Invited Speaker) (University of Science and Technology of China)</td>
<td>Moiré engineering and novel electronic transport at oxide interfaces</td>
</tr>
<tr>
<td>16h15</td>
<td>Jieun Kim (University of Wisconsin-Madison)</td>
<td>Superconducting epitaxial thin films of (111) KTaO₃ grown by hybrid PLD</td>
</tr>
<tr>
<td>16h30</td>
<td>Yanwu Xie (Invited Speaker) (Zhejiang University, China)</td>
<td>Interface and surface superconductivity in KTaO₃</td>
</tr>
<tr>
<td>17h00</td>
<td>Peter Sushko (Pacific Northwest National Laboratory)</td>
<td>Transient electron scavengers modulate carrier density at a polar/nonpolar perovskite oxide heterojunction</td>
</tr>
<tr>
<td>17h15</td>
<td>Kaveh Ahadi (NC State University)</td>
<td>Anisotropic 2D Superconductivity at KTaO₃ (111) Interfaces</td>
</tr>
<tr>
<td>17h30</td>
<td>Dinner provided by iWOE Meeting</td>
<td></td>
</tr>
</tbody>
</table>

**Wednesday 5th October 2022**

### Session: Phase Change/d1
Chair: Marta Gibert, TU Wien

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9h00</td>
<td>Akira Ohtomo (Invited Speaker) (Tokyo Institute of Technology)</td>
<td>Electrochemical Modulation of Electronic States in Strongly Correlated Transition-Metal Oxides</td>
</tr>
<tr>
<td>9h30</td>
<td>Lishai Shoham (Technion - Israel Institute of Technology)</td>
<td>Orbital Occupancy Inversion in Strained SrVO₃ by Soft-XAS: Surface versus Bulk</td>
</tr>
<tr>
<td>9h45</td>
<td>Kei Takahashi (RIKEN CEMS)</td>
<td>Electron doping and epitaxial strain effect in quantum well of SrVO₃ grown by gas source molecular beam epitaxy</td>
</tr>
</tbody>
</table>

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4 | i W O E - 28th
10h00  Ho Nyung Lee (Oak Ridge National Laboratory)
Strained SrNbO₃: A Correlated Oxide Dirac Semimetal that enters the Extreme Quantum Limit

10h15  Gervasi Herranz (Institute for Materials Science of Barcelona ICMAB-CSIC)
Light-matter interactions modulated by electron-lattice coupling in transition metal oxides

10h30  John Heron (University of Michigan)
Interplay Between Structure, Charge, and Spin in Entropy-Stabilized Oxides for Widely Tunable Responses

10h45  Coffee Break

**Session: Applications/Synthesis/Defects**
Chair: Laurence Mechin, The French National Centre for Scientific Research

11h00  Robert Klie (University of Illinois, Chicago)
*Molecular Beam Epitaxy Synthesis of LiMn2O4 Epitaxial Thin Films*

11h15  Lambert Alff (TU Darmstadt)
*Extended defects, substoichiometric phases and defect interactions in oxide based memristive devices*

11h30  **Daniele Marre** (Invited Speaker) (University of Genova)
*Oxide-based nanoelectromechanical sensors and actuators*

12h00  Takahiro Fujita (The University of Tokyo)
*Trend in Optical Bandgap of A₂B₂O₇ (A = Sn, Pb; B = Nb, Ta) Thin Films*

12h15  **Closing Remarks**
| A1 | David Bugallo (Drexel University)  
    | Study of phonon scattering mechanisms in ferroelectric BaTiO$_3$ thin films |
| A2 | Jieun Kim (UC Berkeley)  
    | Understanding the structure-property relationships in relaxor ferroelectric thin films |
| A3 | Ji Hye Lee (Seoul National University)  
    | Functionality of metastable perovskite ferroelectric CaTiO$_3$ thin films |
| A4 | Marco Salluzzo (CNR-SPIN)  
    | A multiferroic two-dimensional electron gas |
| A5 | Jonathan Spring (University of Zurich)  
    | Field-induced reversal of paramagnetic Nd moments in ferromagnetic Nd$_2$NiMnO$_6$/La$_2$NiMnO$_6$ superlattices |
| A6 | Kun Wang (University of Nebraska-Lincoln)  
    | Controlling Ferroelectricity and Quadruple-well State in CuInP$_2$S$_6$ via Interfacial Epitaxial PbZr$_{0.2}$Ti$_{0.8}$O$_3$ |
| A7 | Yilin Li (Cornell University)  
    | Can BaFe$_{12}$O$_{19}$ be Transmuted into a Room-Temperature Ferrimagnetic Ferroelectric? |
| A8 | Zheting Jin (Yale University)  
    | Bond-dependent slave-particle cluster theory based on density matrix expansion |
| A9 | Hans Boschker (Epiray)  
    | Next Generation Epitaxy: clean, simple, fast and versatile |
| A10 | Nipin Kohli (Technical University Berlin)  
    | Investigation of carbon monoxide adsorption on In$_2$O$_3$ surface for gas sensing applications |
| A11 | Nipin Kohli (Technical University Berlin)  
    | Alcohol Sensing Properties of CuO-CNT Hybrids |
| A12 | Shammi Kumar (Shiv Nadar University)  
    | Cubic epitaxial perovskite SrTaO$_3$ for optoelectronic applications |
| A13 | Jaehyeok Lee (Seoul National University)  
    | Low resistance epitaxial edge contacts to buried nanometer thick conductive layer of La-doped BaSnO$_3$ |
| A14 | Nicola Manca (CNR-SPIN)  
<pre><code>| Stress Analysis and Q-Factor of Free-Standing (La,Sr)MnO$_3$ Oxide Resonators |
</code></pre>
<table>
<thead>
<tr>
<th></th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>A15</td>
<td>Mechanical properties of epitaxial EuTiO₃ thin-film MEMS resonators</td>
</tr>
<tr>
<td>A16</td>
<td>Voltage control of spatially-patterned functional responses in lateral perovskite heterostructures via ionic gating</td>
</tr>
<tr>
<td>A17</td>
<td>All-oxide thin-film varactors with Mn- and Ni-doped (Ba,Sr)TiO₃ for microwave applications</td>
</tr>
<tr>
<td>A18</td>
<td>CoFeB/Y₃Fe₅O₁₂ bilayer magnonic resonator for magnetic sensor application</td>
</tr>
<tr>
<td>A19</td>
<td>High-k perovskite gate oxide for modulation beyond 10¹⁴ cm⁻²</td>
</tr>
<tr>
<td>A20</td>
<td>High-quality spinel γ-Fe₂O₃ epitaxial thin film grown on Nb:SrTiO₃ substrate for spin-wave modulation and computation</td>
</tr>
<tr>
<td>A21</td>
<td>Atomic-scale insights into the structural transformations in cathodes for multivalent metal-ion batteries</td>
</tr>
<tr>
<td>A22</td>
<td>From Schottky to ohmic (La,Sr)MnO₃ / (Ba,Sr)TiO₃ contact by interface engineering</td>
</tr>
<tr>
<td>A23</td>
<td>Exploring free-standing PbZr₀.₂Ti₀.₈O₃ membrane and its nonvolatile gating effect in two-dimensional MoS₂</td>
</tr>
<tr>
<td>A24</td>
<td>Epitaxial SrTiO₃ Films with Dielectric Constants Exceeding 25,000</td>
</tr>
<tr>
<td>A25</td>
<td>High-Mobility Field-Effect Transistor Using a 2-Dimensional Electron Gas at the LaScO₃/BaSnO₃ Interface</td>
</tr>
<tr>
<td>A26</td>
<td>Band-Engineered LaFeO₃-LaNiO₃ Interfaces for Electrocatalysis of Water</td>
</tr>
<tr>
<td>A27</td>
<td>A Laser-ARPES View of the 2D Electron Systems at LaAlO₃/SrTiO₃ and Al/SrTiO₃ interfaces</td>
</tr>
<tr>
<td>A28</td>
<td>Gate-tunable spin and orbital Edelstein effect in (111) LaAlO₃/SrTiO₃ interface</td>
</tr>
</tbody>
</table>
| A29 | Lucia Varbaro (University of Geneva)  
Controlling the order parameter coupling in nickelate based superlattices |
| A30 | Maria D’Antuono (University of Naples Federico II)  
Properties of the spin-polarized 2DEG at the LAO/ETO/STO interface |
| A31 | Manish Dumen (INST, INDIA)  
Light-enhanced gating effect at conducting EuO-KTO$_3$ interface |
| A32 | Margaret Anderson (Harvard University)  
Frustrated Magnetism in Rare-earth Titanate Pyrochlore Thin Films Grown by Molecular Beam Epitaxy |
| A33 | Sandeep Kumar Chaluvadi (CNR-IOM)  
Evidence of interfacial Mn-ion displacement and lattice modulations coupled magnetic properties in LSMO films |
| A34 | Dirk Fuchs (Karlsruhe Institute of Technology)  
Proximity induced ferromagnetic state in the spin-orbit semimetal SrIrO$_3$ |
| A35 | Fernando Gallego (CNRS-Thales)  
Application of Rashba-Edelstein effect in ferromagnet/2DEG based Spin-to-charge interconverters |
| A36 | Divine Kumah (North Carolina State University)  
Correlating thickness and temperature dependent structural, electronic and magnetic transitions in epitaxial SrRuO$_3$ thin films |
| A37 | Stefano Gariglio (University of Geneva)  
Coupling of octahedra rotations in orthorhombic perovskite heterostructures |
| A38 | Gervasi Herranz (Institute for Materials Science of Barcelona)  
Dynamic control of octahedra rotation in perovskites by defect engineering |
| A39 | Juhan Kim (Seoul National University)  
Deep-UV transparent conducting oxide La-doped SrSnO$_3$ with high figure of merit |
| A40 | Changjae Roh (GREMAN lab. Univ. Tours CNRS)  
Coexistence of floxo-field and metallicity near crack in SrRuO$_3$ thin films |
| A41 | Victor Rosendal (Technical University of Denmark)  
Electronic states and octahedral tilting in SrNbO$_3$ |
| A42 | Yating Ruan (Technische Universität Darmstadt, Germany)  
Free-standing SrMoO$_3$ single-crystal like thick films |
| A43 | Yeongjae Shin (Yale University)  
Structural and Optical Properties of Erbium-doped Anatase TiO$_2$ Thin Films Grown by Molecular Beam Epitaxy |
**Poster Index: Session B**

**Tuesday 4th October 2022**

| B1  | Dan Ferenc Segedin (Harvard University)  
|     | *Limits to the strain engineering of layered square-planar nickelate thin films* |
| B2  | Jennifer Fowlie (Stanford University)  
|     | *Intrinsic magnetism in superconducting infinite-layer nickelates* |
| B3  | Jiaji Ma (Yale University)  
|     | *Enhancing superconductivity in high Tc cuprates via high-frequency phonons* |
| B4  | Grace Pan (Harvard University)  
|     | *Superconductivity in a quintuple-layer square-planar nickelate: superconducting and electronic properties* |
| B5  | Rebecca Pons (Max Planck Institute for Solid State Research)  
|     | *Rare-Earth Nickelates: from Perovskite to Infinite-Layer* |
| B6  | Y. Eren Suyolcu (Cornell University)  
|     | *Sharpening the Superconducting Transition of Bi$_2$Sr$_2$Ca$_{n-1}$Cu$_n$O$_{2n+4}$ Films with n=1–3 grown by MBE* |
| B7  | Bai Yang Wang (Stanford University)  
|     | *Characterization of the Superfluid Density in Infinite-Layer Nickelates* |
| B8  | Tiffany C Wang (Stanford University)  
|     | *Rare-Earth Control of the Superconducting Upper Critical Field in Infinite-Layer Nickelates* |
| B9  | Wenzheng Wei (Yale University)  
|     | *Physical and electronic structure of square-planar Nickelates* |
| B10 | Ke Zou (University of British Columbia)  
|     | *The effect of spin-polarized EuTiO$_3$ on the monolayer FeSe superconductor* |
| B11 | Jibril Ahammad (Auburn University)  
|     | *SrNbO$_3$ and SrTaO$_3$ Heterostructures Grown Using Hybrid Molecular Beam Epitaxy* |
| B12 | David Bugallo (Drexel University)  
<p>|     | <em>Identifying a MBE growth window for quaternary melilite oxide films by integrating experimental and computational approaches</em> |</p>
<table>
<thead>
<tr>
<th>B13</th>
<th>Gaétan Verdierre (CNRS/Thalès)</th>
<th><em>Epitaxial growth of the candidate ferroelectric Rashba material SrBiO₃ by pulsed laser deposition</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>B14</td>
<td>Sandeep Kumar Chaluvadi (CNR-IOM TASC Laboratory)</td>
<td><em>Direct ARPES and STM investigation of various oxide thin films/heterostructures by Pulsed Laser Deposition at APE-NFFA Beamline</em></td>
</tr>
<tr>
<td>B15</td>
<td>Bruce A. Davidson (The University of British Columbia)</td>
<td><em>Shutter-method growth of (001), (110) and (111)–oriented perovskite films</em></td>
</tr>
<tr>
<td>B16</td>
<td>Benazir Fazlioglu Yalcin (Penn State University)</td>
<td><em>hMBE growth of BaTiO₃ thin films for electrical and optical applications</em></td>
</tr>
<tr>
<td>B17</td>
<td>Patrick Gemperline (Auburn University)</td>
<td><em>Machine Learning Analysis of Reflection High Energy Electron Diffraction Images of Epitaxial Oxide Thin Films</em></td>
</tr>
<tr>
<td>B18</td>
<td>Simon Godin (University of British Columbia)</td>
<td><em>Ex situ ARPES of La₁₋ₓCaₓNiO₃ thin films grown by molecular beam epitaxy</em></td>
</tr>
<tr>
<td>B19</td>
<td>Christo Guguschev (Leibniz-Institut für Kristallzüchtung)</td>
<td><em>Hexagallate substrates for oxide spintronic applications</em></td>
</tr>
<tr>
<td>B20</td>
<td>Varun Harbola (Max Planck Institute for Solid State Research)</td>
<td><em>Dewetting of single crystal oxide membranes</em></td>
</tr>
<tr>
<td>B21</td>
<td>Tatiana Kuznetsova (Pennsylvania State University)</td>
<td><em>Towards ultraclean correlated metal CaVO₃</em></td>
</tr>
<tr>
<td>B22</td>
<td>Federica Luciano (KU Leuven / IMEC)</td>
<td><em>Effect of CMP process on Ba doped PZT deposited by PLD</em></td>
</tr>
<tr>
<td>B23</td>
<td>Johanna Nordlander (Harvard University)</td>
<td><em>Epitaxial thin-film realization of an improper ferroelectric spin-liquid candidate</em></td>
</tr>
<tr>
<td>B24</td>
<td>Jin Young Oh (Sungkyunkwan University)</td>
<td><em>Symmetry Stabilization of High-k Orthoferrite Thin Films</em></td>
</tr>
<tr>
<td>B25</td>
<td>Anchal Rana (BML Munjal University)</td>
<td><em>Tuning the properties of Cathodic Vacuum Arc Deposited Vanadium Oxides thin films</em></td>
</tr>
<tr>
<td>B26</td>
<td>Tobias Schwaigert (Cornell University)</td>
<td><em>Growth of Potassium Tantalate Films by Suboxide-MBE</em></td>
</tr>
<tr>
<td>B27</td>
<td>Henrik Sønstebø (University of Oslo)</td>
<td><em>Opening for Device Integration of RENiO₃ Thin Films by Low Temperature Direct Epitaxy by Atomic Layer Deposition</em></td>
</tr>
</tbody>
</table>
| B28 | Noriyuki Takahara (University of Tokyo)  
*Physical properties of n-type EuTiO$_3$ thin films with La$^{3+}$ (4$f^0$) and Gd$^{3+}$ (4$f^7$) donors grown by gas source molecular beam epitaxy* |
| B29 | Clémentine Thibault (University of Geneva)  
*Growth and study of CaCuO$_2$/SrTiO$_3$ bilayer thin films* |
| B30 | Yijun Yu (Stanford University)  
*In situ soft chemistry engineering of nickelate superconductors* |
| B31 | Matthew Barone (Cornell University)  
*Investigation of Sn$^{2+}$ compounds as candidate p-type conducting oxides* |
| B32 | Yorick Birkhölzer (University of Twente)  
*Nanoscale strain control of the metal-insulator transition in VO$_2$ thin films* |
| B33 | John Dewey (University of Minnesota)  
*Anomalous Strain Relaxation and its Impact on the Valence-Driven Spin-State/Metal-Insulator Transition in Epitaxial (Pr$_{1-y}$Y$_y$)$_{1-x}$Ca$_x$CoO$_{3-δ}$ Films* |
| B34 | Jason Hoffman (Harvard University)  
*Disentangling the insulator-to-metal and structural transitions in VO$_2$ thin films with non-contact atomic force microscopy* |
| B35 | Thor Hvid-Olsen (Technical University of Denmark)  
*Spatial control of the conductivity in SrTiO$_3$-based heterointerfaces using inkjet printing* |
| B36 | Thomas Jespersen (Technical University of Denmark)  
*Electron transport and superconductivity in free-standing LAO/STO micro-membranes on silicon* |
| B37 | Simon Jöhr (University of Zurich)  
*Metal-to-Insulator Transition in Antiferromagnetic SrCrO$_3$ Thin Films* |
| B38 | Darshika Khone (BML Munjal University)  
*Hexagallate substrates for oxide spintronic applications* |
| B39 | Donghan Kim (Institute for Basic Science, Korea)  
*Electric control of two-dimensional Van Hove singularity in oxide ultrathin films* |
| B40 | Barry Koehne (Texas State University)  
*Quantum effects in the electronic properties of epitaxial SrTiO$_3$ films on Si(001)* |
| B41 | Chris Leighton (University of Minnesota)  
*Room-Temperature Valence Transition in a Strain-Tuned Perovskite Oxide* |
| B42 | Ji Soo Lim (Uni Wuerzburg)  
*Anomalous Hall effect in SrIrO$_3$ and SrRuO$_3$ thin films* |
| B43    | Moritz Nunnenkamp (University of Twente)  
|        | Thickness influence of SrTiO3 buffer on CNO nanosheet templated PZT for High electron mobility transistor devices |
| B44    | Jeongkeun Song (Center for Correlated Electron Systems, IBS)  
|        | Higher harmonics in planar Hall effect induced by cluster magnetic multipoles |
| B45    | Lingfei Zhang (The University of Tokyo, Tokyo)  
|        | Unconventional anomalous Hall effect in Ru(III) perovskite oxide thin films |
| B46    | Saeed Almishal (The Pennsylvania State University)  
|        | Correlated Electron Metals with High Entropy |
| B47    | Yingge Du (Pacific Northwest Laboratory)  
|        | Mg$^{2+}$ diffusion across epitaxial Fe$_3$O$_4$/MgO(001) interfaces |