



European Materials Research Society

# 2024 Spring Meeting

May 27 - 31 / Strasbourg Convention Centre

## SYMPOSIUM D

Sustainable thermoelectric materials and applications

*Symposium Organizers:*

Andrei KVALEUSKI, University of Aveiro, Portugal

Qian ZHANG, Harbin Institute of Technology, P. R. China

Wenjie XIE (Main organizer), Technical University of Darmstadt, Germany

**Monday May 27**  
**D01\_Sustainability TE and organic TE 1**

**BERLIN - GROUND FLOOR**

<b>08:45</b>	<b>2718</b>	<b>INV</b>	Thermoelectric Materials From Secondary Raw Materials	<b>WEIDENKAFF Anke</b>
<b>09:15</b>	<b>2781</b>		Large power factor improvement in porous PEDOT:PSS contacted by electrolytes	<b>GARCÍA-CAÑADAS Jorge</b>
<b>09:30</b>	<b>535</b>		Porous conducting polymers for low grade waste heat energy harvesting	<b>BINIEK Laure</b>
<b>09:45</b>	<b>26</b>		Enhancing thermoelectric properties of semicrystalline conjugated polymers through controlled tie chain incorporation	<b>ZHU Wenjin</b>

**Monday May 27**  
**D02\_Sustainability TE and organic TE 2**

**BERLIN - GROUND FLOOR**

<b>10:30</b>	<b>2661</b>	<b>INV</b>	A Path to Sustainable and Scalable Production of High-Performance Thermoelectric Materials	<b>IBÁÑEZ Maria</b>
<b>11:15</b>	<b>2101</b>		Enhancing Organic Thermoelectric Materials Through Local Control Wetting: A Leap Towards High-Performance Flexible Thermoelectric Generators	<b>LISCIO Fabiola</b>
<b>11:30</b>	<b>56</b>		Comprehensive insights into the carbon footprint and energy intensity of thermoelectric generator (TEG) production through life cycle analysis	<b>VRIELINK Sean</b>

**Monday May 27**  
**D03\_TE materials and modules 1**

**BERLIN - GROUND FLOOR**

<b>13:45</b>	<b>1190</b>	<b>INV</b>	Thermoelectric Cooling and Power Generation below 250 Degree Celsius	<b>REN Zhifeng</b>
<b>14:15</b>	<b>932</b>	<b>INV</b>	Characterizing the thermoelectric cooling performance across a broad temperature range	<b>MAO Jun</b>

14:45	2789		Investigation of the operation of thermoelectric modules under actual operating conditions at a small temperature difference by impedance spectroscopy	GARCÍA-CAÑADAS Jorge
15:00	2914		Improving the power factor of thermoelectric materials in hybrid solid/liquid systems	PRIYADARSHI Pankaj
15:15	312		Eco-friendly high-performance thermoelectric mixed-anion oxides	KATASE Takayoshi
15:30	98		High-performance P-type hybrid thermoelectric fibers using co-sputtering for thermoelectric textiles	KIM Da-Hye
15:45	807		Power Supply for Environmental Sensors in Remote Areas	YIN Hao

## Monday May 27 D04\_TE materials and modules 2

### BERLIN - GROUND FLOOR

16:30	1058	INV	Tellurium-free materials for highly efficient thermoelectric modules	NIELSCH Kornelius
17:00	533		Tunable p- and n-Type Tellurium-Free Mg <sub>3</sub> Bi <sub>2</sub> Thermoelectric Thin Films by Thermal Coevaporation	REINDERS Joost
17:15	950		Thermoelectric properties of Mg <sub>3</sub> Sb <sub>x</sub> Bi <sub>2-x</sub> thin films	SADOWSKI Grzegorz
17:30	1530		Unveiling the silicon thermoelectric potential: a comprehensive analysis of its power factor	MASCI Antonella
17:45	2652		Optical and electrical properties of p-type doped CrN films for thermoelectric devices	BULIR Jiri
08:45	later submission	INV	Crystallography beyond average structure: Disorder, chemical bonding and anharmonic motion in thermoelectric materials	IVERSEN Bo Brummerstedt

Tuesday May 28  
**D05\_ Structure and Porperties 1**

BERLIN - GROUND FLOOR

09:15	633	INV	Metavalently bonded tellurides: the essence of improved thermoelectric performance in elemental Te	YU Yuan
09:45	1483		Soft Phonon Mode Triggering Fast Ag Diffusion in Superionic Argyrodite Ag <sub>8</sub> GeSe <sub>6</sub>	SHEN Xingchen

Tuesday May 28  
**D05\_ Structure and Porperties 1**

BERLIN - GROUND FLOOR

09:15	633	INV	Metavalently bonded tellurides: the essence of improved thermoelectric performance in elemental Te	YU Yuan
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Tuesday May 28  
**D06\_ Structure and Porperties 2**

BERLIN - GROUND FLOOR

11:00	1222	INV	Structure and property relationship in thermoelectric materials	JIAQING He
11:30	434	INV	Unlocking the potential of grain boundary modifications in thermoelectric materials	HE Ran
12:00	819		Removing the Oxygen-Induced Donor-like Effect for High Thermoelectric Performance in n-Type Bi <sub>2</sub> Te <sub>3</sub> -Based Compounds	SU Xianli

Tuesday May 28  
**D07\_ Machine learning**

BERLIN - GROUND FLOOR

13:45	1619	INV	Inverse Design of Thermoelectric Materials	ZHANG Hongbin
14:15	1616	INV	Predictions of Thermoelectric Properties via Machine Learning Using Three Publicly Available Datasets	KLEINKE Holger

14:45	657	High-throughput screening of 2D van der Waals crystals with plastic deformability	GAO Zhiqiang
15:00	2471	Using machine learning to accelerate the prediction of thermal conductivity.	SRIVASTAVA Yagyank
15:15	715	Machine-Learning Guided Prediction of Thermoelectric Properties of Topological Insulators	KURIAN ELAVUNKEL Vipin
15:30	1455	Bismuth-based perovskite-derivates with thermal voltage exceeding 40mV/K	TRIFILETTI Vanira

**Tuesday May 28**  
**D08\_ Selenide and TellurideTE**  
**BERLIN - GROUND FLOOR**

16:30	1635	INV	Measurement of the thermoelectric properties of SnSe-based materials and analysis of the corresponding microscopy results	TRITT Terry M.
17:00	2434		The instabilities of thermoelectric high ZT SnSe compounds	THIEM Moritz
17:15	1641		Br-doped n-type SnSe <sub>2</sub> : Single crystal growth and thermoelectric properties	PHAM Anh Tuan
17:30	565		Zigzag Ag <sub>2</sub> Se Nanorod Arrays for Ultrahigh Room Temperature Thermoelectric Performance	AHMAD KHAN Jamal
17:45	1715		Revealing the Prospects of Nanostructured Ag <sub>2</sub> Se in Hybrid Thermoelectric Films	HAMAWANDI Bejan
18:00	818	INV	3D Printing of Mechanically Robust Bulk Thermoelectric Materials with Extraordinary Performance	TANG Xinfeng

**Wednesday May 29**  
**D09\_TE device and application 1**

**BERLIN - GROUND FLOOR**

<b>08:45</b>	<b>885</b>	<b>INV</b>	Practical application of thermoelectric generators as "phase-free" power sources	<b>FUNAHASHI Ryoji</b>
<b>09:30</b>	<b>1396</b>		Thermoelectric Device for Thermal Camouflage, Messaging and Illusion	<b>HOU Yue</b>

**Wednesday May 29**  
**D10\_TE device and application 2**

**BERLIN - GROUND FLOOR**

<b>10:30</b>	<b>2024</b>	<b>INV</b>	Novel thermoelectric devices: a journey beyond sustainable thermoelectric materials	<b>PEREIRA GONÇALVES António</b>
<b>11:00</b>	<b>327</b>	<b>INV</b>	Plastically deformable inorganic thermoelectric materials	<b>WEI Tian-Ran</b>
<b>11:30</b>	<b>767</b>		Exploring the electric and thermoelectric response of ferroelectric 2H and 3R alpha-In <sub>2</sub> Se <sub>3</sub> based devices	<b>DELLA ROCCA Maria Luisa</b>
<b>11:45</b>	<b>560</b>		A Review and Analysis of Power Degradation Mechanisms of Flight-Proven Radioisotope Thermoelectric Generators	<b>CAILLAT Thierry</b>

**Wednesday May 29**  
**DP01\_Poster Session**

**ETOILE - FIRST FLOOR**

<b>13:45</b>	<b>01_1074</b>	<b>105</b>	01_1074 Evaluation of ZnO Debye temperature and lattice thermal conductivity using BOLS theory	<b>DASH Satyasiban</b>
<b>13:45</b>	<b>02_131</b>	<b>105</b>	02_131 Unconventional Seebeck effect in vertically stacked 2D PtSe <sub>2</sub> /PtSe <sub>2</sub> homostructure films	<b>LEE Sang-Kwon</b>
<b>13:45</b>	<b>03_1658</b>	<b>105</b>	03_1658 Unlocking the Potential of Porous Bi <sub>2</sub> Te <sub>3</sub> -based Thermoelectrics using Precise Interface Engineering through Atomic Layer Deposition	<b>KIM Seong Keun</b>

13:45	04_1695	105	04_1695 Enhanced Seebeck effect in trilayer-stacked two-dimensional PtTe <sub>2</sub> /MoS <sub>2</sub> /MoS <sub>2</sub> heterostructures by interface-induced electron-electron interactions	CHOI Jae Won
13:45	05_1698	105	05_1698 Temperature-dependent thermoelectric properties of vertically stacked 2D PtSe <sub>2</sub> /PtSe <sub>2</sub> homo-stacked structure	CHO Jung-Min
13:45	06_1749	105	06_1749 Temperature-dependent X-ray absorption spectroscopy study of thermoelectric Bi <sub>2</sub> Te <sub>3</sub> and Sb <sub>2</sub> Te <sub>3</sub> nanopowders	PUDZS Kaspars
13:45	07_1834	105	07_1834 Temperature-dependent thermoelectric properties and figure of merit (ZT) of p-type semimetallic PtSe <sub>2</sub> thin films	KIM Yunho
13:45	08_2051	105	08_2051 Structural study of non-stoichiometric Cu <sub>2-x</sub> Se compounds and graphene incorporation	VOURLIAS George
13:45	09_2092	105	09_2092 Structure and thermoelectric performance of Ag <sub>2</sub> Se synthesized via the pack cementation process	MALLETZIDOU Lamprini
13:45	10_2307	105	10_2307 Metavalent Bonding Induced Phonon Transport Anomaly in 2D $\delta$ -MX (M = Ge, Sn, Pb; X = S, Se, Te) Monolayers	SURESH NAIR Surabhi
13:45	11_2435	105	11_2435 Thermoelectric properties of NbCoNixSn (x=0-1)	THIEM Moritz
13:45	12_2541	105	12_2541 On the enhancement of thermoelectric performance via hot deformation process	VOURLIAS George
13:45	13_2626	105	13_2626 Contact interface optimization in TiCoSb-based unileg devices for better thermoelectric performance	VERMA Ajay Kumar
13:45	15_411	105	15_411 Enhancing Thermoelectric Performance of Acid-Treatment NbFeSb via Screen-Printing Method	KIM Jooheon
13:45	16_639	105	16_639 Metavalent Bonding-Mediated Dual 6s <sup>2</sup> Lone Pair Expression Leads to Intrinsic Lattice Shearing in n-Type TlBiSe <sub>2</sub>	MARIA Ivy
13:45	17_65	105	17_65 Developing Standard Reference Thermoelectric Materials and Structures for Reliable Output Power Measurements	PARK Sang Hyun
13:45	18_886	105	18_886 Strong Antibonding p-d Hybridization Leads to Intrinsically Low Thermal Conductivity in a Cubic Metal Halide CuBiI <sub>4</sub>	DAS Anustoop
13:45	19_888	105	19_888 High Thermoelectric Performance in Phonon-Glass Electron-Crystal Like AgSbTe <sub>2</sub>	TANEJA Vaishali

13:45	20_890	105	20_890 Vacancy Controlled Nanoscale Cation Ordering Leads to High Thermoelectric Performance	<b>PATHAK Riddhimoy</b>
13:45	21_916	105	21_916 Highly integrated carbon-nanotube-yarn-based thermoelectric generators fabricated by selective inkjet-printed chemical doping	<b>KIM Heesuk</b>



**Thursday May 30**  
**D11\_ New mechanism & Sulfides 1**

**BERLIN - GROUND FLOOR**

<b>08:45</b>	<b>855</b>	<b>INV</b>	Quantum Materials for Thermoelectrics: Past, Present and Future	<b>LI Qiang</b>
<b>09:15</b>	<b>926</b>	<b>INV</b>	Magneto-Seebeck in sulfides: towards metal rich compounds by varying the metal/sulfur ratio	<b>MAIGNAN Antoine</b>
<b>09:45</b>	<b>187</b>		The Analytical Relations between Photo-transport Properties for the Study of Semiconductors	<b>PAN Zhenyu</b>

**Thursday May 30**  
**D12\_ New mechanism & Sulfides 2**

**BERLIN - GROUND FLOOR**

<b>10:30</b>	<b>336</b>	<b>INV</b>	Crystal chemistry and thermoelectric properties in Cu-rich ternary and quaternary sulfides	<b>GUILMEAU Emmanuel</b>
<b>11:00</b>	<b>1459</b>	<b>INV</b>	Thermoelectric properties in magnetic sulfides	<b>HEBERT Sylvie</b>
<b>11:30</b>	<b>1887</b>		New sulfide based materials for thermoelectric applications..	<b>AL BACHA Sandy</b>

**Thursday May 30**  
**D13\_ Heusler, Oxide and others 1**

**BERLIN - GROUND FLOOR**

<b>13:45</b>	<b>1798</b>	<b>INV</b>	Thermoelectricity of p- and n-type full-Heusler compounds	<b>BAUER Ernst</b>
<b>14:15</b>	<b>1440</b>	<b>INV</b>	New directions in half-Heusler and metal phosphide thermoelectric materials	<b>BOS Jan-Willem</b>
<b>14:45</b>	<b>1047</b>	<b>INV</b>	High Thermoelectric Figure-Of-Merits in Conventional Half-Heusler Alloys	<b>POON Joseph</b>
<b>15:15</b>	<b>714</b>	<b>INV</b>	Fe-based Half Heusler Thermoelectric Materials	<b>MIYAZAKI Yuzuru</b>

15:45 944 Amorphous TiNiSn for Next-Generation Flexible Thermoelectric Devices KHAYYAMIFAR Sana

Thursday May 30  
**D14\_Heusler, Oxide and others 2**

**BERLIN - GROUND FLOOR**

16:30	1320	INV	Phonon-Glass Electron-Crystal like High Performance Thermoelectrics	BISWAS Kanishka
17:00	1978	INV	Doped SrTiO <sub>3</sub> based Oxide Composites: Breakthrough in High Temperature Thermoelectric Power Generation	MAITI Tanmoy
17:45	178		Effect of reducing agents and plasmonic nanoparticles on thermal and electrical properties of reduced graphene oxide	GURUNG Sweta