

# Academic CV – Antonio Altana

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<b>Personal information</b>	Name: Antonio Altana Date of birth: 10/11/1990 Place of birth: Sassari (SS), Italy Nationality: Italian Address: Viale Druso 197, 39100 Bolzano, Italy Telephone number: +39 3392054847 E-Mail: antonio.altana@unibz.it
<b>Education</b>	<ul style="list-style-type: none"><li>• September 2014 - April 2017, <b>Master's Degree in Electronic Engineering</b>, Università degli studi di Cagliari. Thesis title: "Characterization and modeling of organic field effect transistors manufactured using large area techniques". Supervisor: Prof. Piero Cosseddu.</li><li>• September 2009 - April 2014, <b>Bachelor's Degree in Electronic Engineering</b>, Università degli studi di Cagliari. Thesis title: "Regularized deconvolution applied to ground penetrating radar systems". Supervisor: Prof. Giuseppe Rodriguez.</li></ul>
<b>Present appointments</b>	<ul style="list-style-type: none"><li>• February 2023 – present, , <b>Technologist</b>, Free University of Bolzano-Bozen for the Competence Center for Mountain Innovation Ecosystems, Sensing Technologies Laboratory. Supervisor: Prof. Paolo Lugli. Research activity on Technological Solutions for monitoring Mountain Ecosystems, in terms of technical support for development, characterization and integration of devices and sensors. Support for the preparation of scientific documents, proposals for research projects and reports requested by the funding bodies of the research projects. Support in the relationships with different industrial and academic research partners, locally, nationally, and internationally</li><li>• September 2021- January 2023, <b>Research assistant</b> at the Faculty of Science at Technology of the Free University of Bolzano-Bozen in the <u>Sensing Technologies Laboratory</u>. Supervisor: Prof. Paolo Lugli. Research activity on Printing technologies for devices (sensors, biosensors, actuators, energy harvesters) and systems electronic systems based on nanomaterials and nanostructures.</li></ul>

<b>Professional experiences</b>	<ul style="list-style-type: none"> <li>September 2019-September 2021, <b>Process Engineer</b> at Fraunhofer EMFT, Munich (DE). Development of manufacturing processes for R2R flexible electronic devices.</li> <li>April 2018-July 2019, <b>R&amp;D engineer</b>, Is It Fresh GmbH, Aachen (DE), Development of a manufacturing process and system integration of cost-effective flexible electronic devices for real-time monitoring of physical and chemical indicators in food, such as water content, temperature, humidity, pH, salinity, oxygen and CO2.</li> <li>August 2017-December 2017, <b>Technologist Trainee</b>, Laboratoire ITODYS, Université Paris 7Diderot, Paris (FR). Process development for printed DNA bio-sensors and device characterization. Supervisor: Prof. Giorgio Mattana.</li> </ul>
<b>Participation in exhibitions</b>	<ul style="list-style-type: none"> <li>Participation in Plug and Play Food &amp; Beverage start-up program, Is It Fresh, Milano, Italy, July 2019.</li> <li>Open Day for Schools, Free University of Bolzano-Bozen – 31.05.2022</li> <li>Inauguration of the competence center SMOACT Human to Machine 30.09.2022 Live Demo Bolzano</li> </ul>
<b>Grants</b>	<ul style="list-style-type: none"> <li>Winner of Erasmus+ for Traineeship Program 2016/2017 Grant.</li> </ul>
<b>Experience in academic teaching</b>	<p><b><u>Lab Assistant at Free University of Bolzano-Bozen:</u></b></p> <ul style="list-style-type: none"> <li>Academic year 2022/2023, (Lecturer) exercise and laboratories of the course "Sensors and biosensors for food processing" for M.Sc. students of Food Engineering (LM70)</li> </ul> <p><b><u>M. Sc/Ph.D. student supervision at Free University of Bolzano-Bozen:</u></b></p> <ul style="list-style-type: none"> <li>Hamed Saleh, "In planta sensing technologies for Agriculture 4.0", Ph.D. in Advanced Systems Engineering, 36<sup>th</sup> cycle.</li> <li>Suraci Picchiotti Eduardo, "Development of a low-cost platform to monitor plant stress condition", Ph.D. in Advanced Systems Engineering, 37<sup>th</sup> cycle.</li> </ul>

<p><b>Research Activities and Projects</b></p>	<p><b><u>Summary of Research Activities at UNIBZ:</u></b></p> <p>Research is focused in the field of flexible electronic devices and sensors, using printing and microfabrication methods, and their integration mostly in agricultural and healthcare applications. The activities include:</p> <ul style="list-style-type: none"> <li>- the design, development and field validation of a customized platform for plant health monitoring (water content induced stress) based on bioimpedance spectroscopy,</li> <li>- the development of tracing techniques for plant protection products for precision agriculture, according to ISO for certification development,</li> <li>- the design and manufacturing of sensors using thin film deposition techniques, such as inkjet printing, screen printing, spray deposition and micro-fabrication such as photolithography, employing innovative materials, principally on flexible substrates,</li> <li>- the electrical, morphological and optical characterization of electronic devices/sensors and implementation of the automatic measurement system and probe station,</li> <li>- the responsibility for printing and electrical measuring instruments, in terms of maintenance, optimization of the process, drafting user manuals and standard operating procedures for the transfer of know-how (providing support and training to researcher),</li> <li>- the interaction with suppliers for quotation and pricing requests, for equipment, instruments and consumables for lab and research proposal writing, within public calls,</li> <li>- the writing of project proposals for the acquisition of regional funds and commissioned research projects.</li> </ul> <p><b><u>Summary of Research Activities in previous experience:</u></b></p> <p>In the previous working experience, the research activities involved:</p> <ul style="list-style-type: none"> <li>- the development of manufacturing processes with high yield for flexible electronic devices, through printing, laser ablation, chemical vapor deposition and other thin film deposition techniques,</li> <li>- the morphological characterization of the manufactured devices/sensors through atomic force microscope, profilometer and laser scanning microscope,</li> <li>- the integration of the manufactured devices with customized readout electronics,</li> <li>- the characterization and modeling of the fabricated organic field effect transistor for electrical simulation using probe station,</li> <li>- the modeling of the fabricated electrochemical sensors, in terms of equivalent circuit,</li> <li>- the ink development and rheological characterization of solution processable active materials,</li> <li>- the calibration and validation against standard techniques of ultra-</li> </ul>
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	<p>low-cost novel sensors,</p> <ul style="list-style-type: none"><li>- the field validation and integration of multi-sensor platform in food application,</li><li>- the integration of electrical characterization instrument with graphical user interface for automatic measurement,</li><li>- the drafting of technical and economic requirements for the purchase of microfabrication, printing and laser tools in collaboration with industrial and research entities,</li><li>- the production of documents for standard operating procedures and project proposals, including feasibility study and financial analysis.</li></ul>
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<p><b>Academic and Industrial collaborations</b></p>	<p><b><u>Academic and industrial collaborations at UNIBZ:</u></b></p> <p>Research activity for integration and testing of wearable sensors in collaboration with Microgate Srl (IT)</p> <p>Project management of the feasibility study about printed conductive patterns on wood, including its economical evaluation and technical report, as commissioned research for Holz Pichler AG (IT)</p> <p>Draft of submission proposal to the 'NOI Fusion Grant 2022' with the awarded project "Towards a smart factory: sensorization and digitalization of the production plant for wastewater monitoring" in collaboration with Loacker AG (IT)</p> <p>Drafting the price list for services provided by the sensing technology laboratory in the NOI techpark facilities</p> <p>Rapid prototyping of bio impedance electrodes, by thin film deposition for bio medical and robotics application in collaboration South Denmark University SDU, The Maersk Mc-Kinney Moller Institute, Dr. Zhuoqi Cheng.</p> <p><b><u>Academic and industrial collaborations in previous experience:</u></b></p> <p>Research activities coordinated between Juelich Forschungszentrum, RWTH Aachen and COPT Zentrum Koeln (DE), providing technical support and supervision for doctoral students' projects.</p> <p>Installation and acceptance testing of newly purchased automated printing line in agreement with system requirements with Aurel Spa (IT).</p> <p>Requirements definition, installation and acceptance test for automated ultrashort laser ablation system from Pulsar Photonics GmbH (DE).</p> <p>Sensor fabrication, calibration and integration in food application for Samsung Welstory Inc (KR).</p> <p>Pilot project for development and integration of sensors for water hardness monitoring in water jug for Brita GmbH (DE).</p> <p>Electrical evaluation of in-house semiconductor technologies in the form of circuit component in collaboration with PragmatIC (UK).</p> <p>Design of an automated calibration platform for gas sensors in collaboration with Ateknea Solutions (ES).</p> <p>Feasibility study for patterning thin conductive layers by laser to eliminate additive processes and increase yield by reducing fabrication steps for Inuru GmbH (DE).</p> <p>Evaluation of electrical properties of layers deposited with novel copper inks by printing and sintering processes in collaboration with Copprint (IL).</p> <p>Process development of a laser and print patterning method for placing micro-LEDs on a thin transparent substrate for Louisenthal Papierfabrik GmbH (DE)</p> <p>Development of a scaled-up fabrication process of printed bio enzymatic fuel cells for BeFC (FR).</p> <p>Process development of semi-additive method combining microfabrication techniques for micro components placement on flexible substrates for Cicorel (CH).</p>
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<b>Projects</b>	<p><b>Projects involved in at UNIBZ</b></p> <ul style="list-style-type: none"> <li>• STEX – “Smart textile for monitoring muscles activity” – European founded project - FESR1127. Website: <a href="http://stex.microgate.it/">http://stex.microgate.it/</a>. PI: prof. Paolo Lugli</li> <li>• SMOCT Competence center, thin film deposition by printing technology, <a href="https://www.smoct.cc/live-demos-fabbriche-scuola">https://www.smoct.cc/live-demos-fabbriche-scuola</a></li> </ul> <p><b>Projects involved in during previous experience</b></p> <ul style="list-style-type: none"> <li>• TRAICT– “Trusted Resource Aware ICT” – BMBF funded project. <a href="https://www.ipms.fraunhofer.de/en/Strategic-Research-Areas/Trusted-Electronics.html">https://www.ipms.fraunhofer.de/en/Strategic-Research-Areas/Trusted-Electronics.html</a></li> <li>• EFRE-0800361 Packsense, Is It Fresh GmbH</li> </ul>
<b>Publications</b>	<p><b>Journal articles in refereed academic journals</b></p> <ol style="list-style-type: none"> <li>1. Beale C., <b>Altana A.</b>, Hamacher S., Yakushenko A., Mayer D., Wolfrum B., Offenhäusser A. (2022). Inkjet printed Ta2O5 on a flexible substrate for capacitive pH sensing at high ionic strength. <i>Sensors and Actuators B: Chemical</i>, 369, 132250.</li> </ol> <p><b>Refereed conference proceedings</b></p> <ol style="list-style-type: none"> <li>2. <b>Altana A.</b>, Becce L., Avancini E., Lugli P., Petti L., Mazzetto F., (2022). Cost-effective tracing techniques for the rapid characterization of spray deposition and drift through electrical conductivity and fluorescence. <i>IEEE MetroAgriFor 2022, paper accepted</i></li> <li>3. <b>Altana A.</b>, Becce L., Lugli P., Petti L., Mazzetto F., (2022). Uranine as a tracer for rapid detection of spray deposition. <i>Biosystems engineering towards the green deal AIIA 2022, abstract accepted</i></li> <li>4. Ciocca M., Febo C., Massoumi F., <b>Altana A.</b>, Cantarella G., Lugli P., Petti L., (2022). 3D bio-printed light-sensitive cell scaffolds based on polymer nanoparticles for bio-photonics applications. <i>2022 IEEE International Flexible Electronics Technology Conference (IFETC), abstract accepted</i></li> </ol> <p><b>Speaker at the following conferences:</b></p> <ul style="list-style-type: none"> <li>• “IEEE MetroAgriFor 2022” 3-5 November 2022. Presentation title: “Cost-effective tracing techniques for the rapid characterization of spray deposition and drift through electrical conductivity and fluorescence”</li> </ul>
<b>Entrepreneurship</b>	<p><b>Patent application:</b> “Method for Manufacturing a Sheet with Double-Sided Structured Conducting Layers for Electronic Application”</p>
<b>Language competence</b>	<p>Italian: Mother Tongue English: C1 (Language center of the Free University of Bozen-Bolzano,</p>

	Bolzano, 2022). German: A2.2
<b>Driving license</b>	B

**Date 27/02/2023**

**Signature**

# Curriculum Vitae – Enrico Avancini

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## Informazioni personali

Enrico Avancini  
Nato a Trento, 05/04/1989  
Nazionalità Italiana  
Piazza dell'Assunta 28, 38121 Trento, Italia  
E-Mail: enrico.avancini@unibz.it

## Formazione

- Dottore in Fisica, 2012, Università di Trento
- Master of Science (M.Sc.) in Fisica, Freie Universität Berlin, 2014
- Doctor of Sciences (Dr. sc. ETH Zurich), ETH Zurich, 2019 (ottenuto presso il Dept. of Information Technology and Electrical Engineering)

## Ruolo attuale

- Tecnologo a tempo determinato di primo livello
- Inizio del contratto: 15 febbraio 2023
- Tempo pieno
- Datore: Libera Università di Bolzano
- Ruolo: organizzazione delle attività dei laboratori nel gruppo di ricerca di riferimento, supporto alla stesura dei progetti, dei documenti di progetto e supporto alla gestione dei budget, ricerche di mercato e valutazioni tecniche di ordini e acquisti;

## Esperienza professionale

Da/a	Titolo	Istituto	Livello accademico	Ruolo
Settembre 2013- settembre 2014	Student assistant	Helmholtz-Zentrum Berlin für Materialien und Energie	Studente master	Attività di supporto alla ricerca nell'ambito delle misure di spettroscopia fotoelettronica e di fotovoltaaggio di superficie su materiali per il fotovoltaico a film sottile. Stesura della tesi.
Nov 2014- Feb 2019	PhD Student	Empa- Swiss Federal Laboratories for Materials Science and Technology, CH-8600 Dübendorf, Switzerland	Studente di dottorato	Attività di ricerca e laboratorio nell'ambito della fabbricazione e caratterizzazione delle celle fotovoltaiche in CIGS. Attività di partecipazione in collaborazioni scientifiche interne (ulteriori tecnologie), con altri enti di ricerca europei, e con partner industriali. Stesura di manoscritti per riviste internazionali peer-reviewed, stesura della tesi di dottorato.
Apr 2019- Gen 2020	Assegnista di ricerca	Libera Università di Bolzano		Gestione e organizzazione delle attività di installazione del materiale atto alla costruzione dei laboratori del Sensing Technologies Lab al NOI Techpark (Bolzano, Italia). Pianificazione delle attività di ricezione delle istruzioni d'uso e manutenzione. Ricerche di mercato per l'acquisto di materiale consumabile. Stesura della documentazione di progetto (EFRE/FESR1068) Senslab. Collaborazione nel lavoro di ricerca due studenti di dottorato negli ambiti dei biosensori e dei sensori di gas.
Gen 2020 – Gen 2022	Tecnologo a tempo determinato di primo livello	Libera Università di Bolzano		Gestione di progetto e di laboratorio, ricerche di mercato per materiale consumabile e piccola strumentazione. Gestione dei rapporti con i fornitori. Supervisione delle installazioni, ricevimento delle istruzioni di manutenzione e utilizzo, gestione della nuova strumentazione e stesura dei documenti di rendicontazione necessari nell'ambito del progetto FESR1068



				Senslab volto alla costruzione di laboratori per la fabbricazione e caratterizzazione di elettronica flessibile per scopi di ricerca. Transizione da tempo pieno a parziale (70%) nel luglio 2020.
Gen 2022-Gen 2023	Tecnologo a tempo determinato di primo livello	Libera Università di Bolzano		Tempo parziale 75%. Supervisione delle installazioni e sviluppo dei processi, gestione di laboratorio e di progetto nell'ambito del progetto FESR1140 Phylab volto alla costruzione di un laboratorio per la deposizione di film sottili con tecnica sputtering. Rapporti con i fornitori. Ruolo di direttore per l'esecuzione del contratto per la fornitura dello strumento principale (macchinario per magnetron sputtering).

### Esperienza di insegnamento accademico

Lezione ospitata dal titolo: "Photovoltaics: basic concepts and technology" in corsi all'Università di Bolzano dal titolo "Introduction to printing technologies and flexible components", tenuta due volte (ospitata in giugno 2021 nel Corso della Prof.ssa Petti e in maggio 2022 dal corso della Dr. Costa Angeli).

### Altre responsabilità accademiche

Direttore di esecuzione nell'ambito della procedura di gara "Fornitura di uno strumento funzionante per Magnetron Sputtering" (CIG 86865163C5).

### Ricerca e progetti

- Progetti:
  - Assegnazione come Tecnologo per il progetto FESR Phylab (FESR1140) della Provincia Autonoma di Bolzano dal gennaio 2022 al dicembre 2022
  - Assegnazione come Tecnologo per il progetto FESR Senslab (FESR1068) della Provincia Autonoma di Bolzano dal gennaio 2020 al gennaio 2021
  - Partecipazione a collaborazioni scientifiche e incontri di progetto durante l'impiego come studente di dottorato presso Empa (Svizzera) nell'ambito del progetto Sharc25 (Horizon2020);
  - Collaborazione esterna nei progetti FESR STEX (Provincia Autonoma di Bolzano) nella gestione della attività in laboratorio e stesura della documentazione. Ruolo analogo nel progetto SSP della Libera Università di Bolzano.

- Attività di revisione per diverse riviste peer-reviewed
- Premi:

Date granted	Award Holder(s)	Funding Body	Title	Amount received
18-22 Giugno 2018	Enrico Avancini	European Material Scientist Society	Young Scientist Award 2018 E-MRS Spring Meeting, Symposium A	Eur 450

### Pubblicazioni

1. Kranz, L.; Abate, A.; Feurer, T.; Fu, F.; Avancini, E.; Löckinger, J.; Reinhard, P.; Zakeeruddin, S. M.; Grätzel, M.; Buecheler, S.; Tiwari, A. N. *High-Efficiency Polycrystalline Thin Film Tandem Solar Cells*. The Journal of Physical Chemistry Letters 2015 6 (14), 2676–2681. DOI: 10.1021/acs.jpcclett.5b01108
2. Reinhard, P.; Bissig, B.; Pianezzi, F.; Avancini, E.; Hagendorfer, H.; Keller, D.; Fuchs, P.; Döbeli, M.; Vigo, C.; Crivelli, P.; et al. *Features of KF and NaF*

- Postdeposition Treatments of Cu(In,Ga)Se<sub>2</sub> Absorbers for High Efficiency Thin Film Solar Cells.* Chemistry of Materials 2015, 27 (16), 5755–5764. DOI: 10.1021/acs.chemmater.5b02335
3. Fu, F.; Feurer, Jaeger, T.; T.; Avancini, E.; Bissig, B.; Yoon, S.; Buecheler, S.; Tiwari, A. N. *Low-Temperature-Processed Efficient Semi-Transparent Planar Perovskite Solar Cells for Bifacial and Tandem Applications.* Nature Communications 2015, 6, 8932. DOI: 10.1038/ncomms9932
  4. Fuchs, P.; Steinhäuser, J.; Avancini, E.; Romanyuk, Y. E.; Tiwari, A. N. *Evolution of Carbon Impurities in Solution-Grown and Sputtered Al:ZnO Thin Films Exposed to UV Light and Damp Heat Degradation.* RSC Advances 2016, 6 (59), 53768–53776. DOI: 10.1039/C6RA06861H
  5. Bissig, B.; Guerra-Nunez, C.; Carron, R.; Nishiwaki, S.; La Mattina, F.; Pianezzi, F.; Losio, P. a.; Avancini, E.; Reinhard, P.; Haass, S. G.; et al. *Surface Passivation for Reliable Measurement of Bulk Electronic Properties of Heterojunction Devices.* Small 2016, 12(38), 5339–5346. DOI: 10.1002/sml.201601575.
  6. Feurer, T.; Reinhard, P.; Avancini, E.; Bissig, B.; Löckinger, J.; Fuchs, P.; Carron, R.; Weiss, T.; Perrenoud, J.; Stuttenheim, S.; Buecheler, S.; Tiwari, A. N. *Progress in Thin Film CIGS Photovoltaics – Research and Development, Manufacturing, and Applications.* Progress in Photovoltaics: Research and Applications 2016, 25(7), 645–667. DOI: 10.1002/pip.2811
  7. \*Nishiwaki, S.; Feurer, T.; Bissig, B.; Avancini, E.; Carron, R.; Buecheler, S.; Tiwari, A. N. *Precise Se-Flux Control and Its Effect on Cu(In,Ga)Se<sub>2</sub> absorber Layer Deposited at Low Substrate Temperature by Multi Stage Co-Evaporation.* Thin Solid Films 2017, 633 (Special Issue, E-MRS 2016 Spring Meeting, Symposium V), 18–22. DOI: 10.1016/j.tsf.2016.10.057
  8. Avancini, E.; Carron, R.; Bissig, B.; Reinhard, P.; Menozzi, R.; Sozzi, G.; Di Napoli, S.; Feurer, T.; Nishiwaki, S.; Buecheler, S.; Tiwari, A. N.. *Impact of Compositional Grading and Overall Cu Deficiency on the near-Infrared Response in Cu(In, Ga)Se<sub>2</sub> Solar Cells.* Progress in Photovoltaics: Research and Applications 2017, 25(3), 233–241. DOI: 10.1002/pip.2850
  9. Fu, F.; Feurer, T.; Weiss, T. P.; Pisoni, S.; Avancini, E.; Andres, C.; Buecheler, S.; Tiwari, A. N. *High-Efficiency Inverted Semi-Transparent Planar Perovskite Solar Cells in Substrate Configuration.* Nature Energy 2017, 2 (1), 16190. DOI: 10.1038/nenergy.2016.190
  10. Avancini, E.; Carron, R.; Weiss, T. P.; Andres, C.; Bürki, M.; Schreiner, C.; Figi, R.; Romanyuk, Y. E.; Buecheler, S.; Tiwari, A. N. *Effects of Rubidium Fluoride and Potassium Fluoride Postdeposition Treatments on Cu(In,Ga)Se<sub>2</sub> Thin Films and Solar Cell Performance.* Chemistry of Materials 2017, 29 (22), 9695–9704. DOI: 10.1021/acs.chemmater.7b03412.
  11. Weiss, T. P.; Nishiwaki, S.; Bissig, B.; Carron, R.; Avancini, E.; Löckinger, J.; Buecheler, S.; Tiwari, A. N. *Injection Current Barrier Formation for RbF Postdeposition-Treated Cu(In,Ga)Se<sub>2</sub>-Based Solar Cells.* Advanced Materials Interfaces 2017, 5(4), 1701007. DOI: 10.1002/admi.201701007
  12. Parvan, V.; Mizrak, A.; Majumdar, I.; Ümsür, B.; Calvet, W.; Greiner, D.; Kaufmann, C. A.; Dittrich, T.; Avancini, E.; Lauermann, I. *Cu(In,Ga)Se<sub>2</sub> surface Treatment with Na and NaF: A Combined Photoelectron Spectroscopy and Surface Photovoltage Study in Ultra-High Vacuum.* Applied Surface Science 2018, 444, 436–441. DOI: 10.1016/j.apsusc.2018.03.014
  13. Bissig, B.; Carron, R.; Greuter, L.; Nishiwaki, S.; Avancini, E.; Andres, C.; Feurer, T.; Buecheler, S.; Tiwari, A. N. *Novel Back Contact Reflector for High Efficiency and Double-Graded Cu(In,Ga)Se<sub>2</sub> Thin-Film Solar Cells.* Progress in Photovoltaics: Research and Applications 26(11), 2018. DOI: 10.1002/pip.3029.
  14. Wolter, M.H.; Bissig, B.; Avancini, E.; Carron, R.; Buecheler, S.; Jackson, P.; Siebentritt, S.. *Influence of Sodium and Rubidium Postdeposition Treatment on the Quasi-Fermi Level Splitting of Cu(In,Ga)Se<sub>2</sub>Thin Films.* IEEE J. Photovolt. 2018, 8-5, 1320-1325 DOI: 10.1109/JPHOTOV.2018.2855113.
  15. Werner, F.; Wolter, M.H.; Siebentritt, S.; Sozzi, G.; Di Napoli, S.; Menozzi, R.; Jackson, W.; Carron, R.; Avancini, E.; Weiss, T.P.; Buecheler, S.. *Alkali treatments of Cu(In,Ga)Se<sub>2</sub>thin-film absorbers and their impact on transport barriers.* Progress in Photovoltaics: Research and Applications 2018, 26(11), 912-923. DOI: 10.1002/pip.3032
  16. Feurer, T.; Bissig, B.; Weiss, T.P.; Carron, R.; Avancini, E.; Loeckinger, J.; Buecheler, S.; Tiwari, A.N.. *Single-graded CIGS with narrow bandgap for tandem*

- solar cells*. Science and Technology of Advanced Materials 2018, 19(1): 263-270. DOI: 10.1080/14686996
17. Carron, R.; Avancini, E.; Feurer, T.; Bissig, B.; Losio, P.A.; Figi, R.; Schreiner, C.; Buerki, M.; Bourgeois, E.; Nasladek, M.; Buecheler, S.; Tiwari, A.N.. *Refractive indices of layers and optical simulations of Cu(In,Ga)Se<sub>2</sub> solar cells*. Science and Technology of Advanced Materials 2018, 19(1), 396-410. DOI: 10.1080/14686996.2018.1458579.
  18. Avancini, E.; Keller, D.; Carron, R.; Arroyo Rojas-Dasilva, Y.; Erni, R.; Priebe, A.; Di Napoli, S.; Carrisi, M.; Menozzi, R.; Fu, F.; Buecheler, S.; Tiwari, A.N.. *Voids and compositional inhomogeneities in Cu(In,Ga)Se<sub>2</sub> thin films: evolution during growth and impact on solar cell performance*. Science and Technology of Advanced Materials 2018, 19(1), 871-882. DOI: 10.1080/14686996.2018.1536679.
  19. \*Carron, R.; Andres, C.; Avancini, E.; Feurer, T.; Nishiwaki, S.; Pisoni, S.; Fu, F.; Lingg, M.; Romanyuk, Y.E.; Buecheler, S.; Tiwari, A.N.. *Bandgap of thin film solar cell absorbers: A comparison of various determination methods*. Thin solid films 2019, Volume 669 (E-MRS 2018, Symposium A : Chalcogenide PV), 482-486. DOI: 10.1016/j.tsf.2018.11.017
  20. \*Feurer, T.; Fu, F.; Weiss, T.P.; Avancini, E.; Loeckinger, J.; Buecheler, S.; Tiwari, A.N.. *RbF post deposition treatment for narrow bandgap Cu(In,Ga)Se<sub>2</sub> solar cells*. Thin solid films 2019, Volume 669 (E-MRS 2018, Symposium A : Chalcogenide PV), 34-40. DOI: 10.1016/j.tsf.2018.12.003
  21. Weiss, T.P.; Carron, R.; Wolter, M.H.; Loeckinger, J.; Avancini, E.; Siebentritt, S.; Buecheler, S.; Tiwari, A.N.. *Time-resolved photoluminescence on double graded Cu(In,Ga)Se<sub>2</sub> – Impact of front surface recombination and its temperature dependence*. Science and Technology of Advanced Materials 2019, 20(1): 313-323. DOI: 10.1080/14686996.2019.1586583
  22. Carron, R.; Nishiwaki, S.; Feurer T.; Hertwig, R.; Avancini, E.; Loeckinger, J.; Yang, S.; Buecheler, S.; Tiwari, A.N.. *Advanced Alkali Treatments for High-Efficiency Cu(In,Ga)Se<sub>2</sub> Solar Cells on Flexible Substrates*. Advanced Energy Materials 2019, 9(24): 1900408. DOI: 10.1002/aenm.201900408
  23. Sastre, J.; Lin, T.; Filippin, A.N.; Priebe, A.; Avancini, E.; Michler, J.; Tiwari, A.N.; Romanyuk, Y.; Buecheler, S.. *Aluminum-Assisted Densification of Cosputtered Lithium Garnet Electrolyte Films for Solid-State Batteries*, ACS Appl. Energy Mater. 2019, 2, 12, 8511-8524. DOI: 10.1021/acsaem.9b01387
  24. Siebentritt, S. *et al. Heavy Alkali Treatment of Cu(In,Ga)Se<sub>2</sub> Solar Cells: Surface versus Bulk Effects*. Adv. Energy Mater.2020, 10, 1903752, DOI: 10.1002/aenm.20190375
  25. Bombsch, J.; Avancini, E.; Carron, R.; Handick, E. Garcia-Diez, R.; Hartmann, C.; Félix, R; Ueda, S.; Wilks, R.W.; Bär, M.. *NaF/RbF-Treated Cu(In,Ga)Se<sub>2</sub> Thin-Film Solar Cell Absorbers: Distinct Surface Modifications Caused by Two Different Types of Rubidium Chemistry*. ACS Appl. Mater. Interfaces 2020, 12, 31, 34941–34948, DOI: 10.1021/acsaem.9b01387
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## Corsi

- Partecipazione al Corso “LABORATORI DI RICERCA E DI ANALISI: PREVENZIONE DEL RISCHIO BIOLOGICO E CHIMICO”, Aifes, 8-9 novembre 2022
- Partecipazione al corso online “IL CODICE DEI CONTRATTI PUBBLICI”, Promo P.A. fondazione, 2020.

**Competenze  
linguistiche**

Italiano madrelingua  
Inglese ottima conoscenza parlata e scritta  
Tedesco conoscenza base

**Patente**

B

## Academic CV: Luisa Petti

**Nationality:** Italian **Date and Place of Birth:** 04<sup>th</sup> of June 1987, Munich, Germany  
**Career Breaks for Maternity Leave:** 10 months (09.2015 – 01.2016 + 10.2018 – 03.2019)

### Education

2016 Ph.D., ETH Zurich, Zurich, Switzerland  
2011 M.Sc. in Electronic Engineering, Politecnico di Milano, Milan, Italy  
2009 B.Sc. in Electronic Engineering, Politecnico di Milano, Milan, Italy

### Academic Positions

2022 – now Habilitated as Full Professor in Electronics  
2022 – now Course Director, B.Sc. in Electronics and Cyber-Physical Systems, Free University of Bozen-Bolzano, Bolzano, Italy  
2021 – now Associate Professor, Free University of Bozen-Bolzano, Bolzano, Italy  
2021 – now Responsible for Sensor System Technology Lab at NOI Techpark, Bolzano, Italy  
2021 – now Quality Committee Member, Free University of Bozen-Bolzano, Bolzano, Italy  
2020 – now Member of the Competence Center “Health of the Plants”, Free University of Bozen-Bolzano, Bolzano, Italy  
2018 – 2021 Assistant Professor, Free University of Bozen-Bolzano, Bolzano, Italy  
2016 – 2018 (from 10/2016 at 10%) Research Associate, ETH Zurich, Zurich, Switzerland  
2014 – 2014 Visiting Research Assistant, Imperial College London, London, UK  
2012 – 2016 Research Assistant (PhD Student), ETH Zurich, Zurich, Switzerland

### Industrial Positions

2017 – 2018 Research Engineer at FlexEnable Limited, Cambridge, UK  
2016 – 2017 Scientist at Cambridge Display Technology (CDT), Godmanchester, UK  
2014 – 2014 Intern at Apple Incorporated, Cupertino, California, USA

### Awards

2021 Outstanding Review Editor Awards, Frontiers in Nanotechnology, London, UK,  
2019 IEEE Electron Device Society Early Career Award, San Francisco, US  
2016 ETH Medal for outstanding PhD thesis of ETH Zurich, Zurich, Switzerland  
2013 Best Paper Award at International Thin-Film Transistor Conference, Tokyo, Japan  
2011 Gold Medal for top 40 BSc Graduates 2008-2009 of Politecnico di Milano, Milan, Italy

### Conference Organization Responsibilities

2023 TPC Member of IEEE Flexible and Printed Sensors Conference  
2023 Technical Co-Chair of IEEE International Flexible Electronics Technology Conference  
2022 TPC Member of IEEE Electron Device Technology Manufacturing Conference  
2022 AB Member of IEEE Micro/Nanoelectronics, Devices, Circuits, and Systems Conference  
2021 Technical Co-Chair of IEEE International Flexible Electronics Technology Conference  
2021 TPC Member of IEEE Electron Device Technology Manufacturing Conference  
2020 Organizer and Co-Chair of “Technologies for the Future” Workshop

### Editorial Responsibilities

2022 – now Associate Editor of IEEE Transaction on Agrifood Electronics (IEEE TAFE)  
2020 – now Associate Editor of Frontiers in Electronics (Section: Flexible Electronics)

### Scientific Society Responsibilities

2022 Founding Member of the Network of Italian Scientist Active in Germany (SIGN)

2022 Local Unit Responsible of the Inter-University Consortium for Nanoelectronics (IUNET)  
2022 Founding Member of IEEE Women in EDS (WiEDS)  
2022 TC Member of Additive Manufacturing Electronic Systems (AMES) of IEEE RFIDC  
2022 TC Member of MEMS and Nanotechnologies of IEEE IES  
2021 Local Unit Responsible of the Italian Electronic Society (SIE)  
2020 SIG Member of Electronics for Agrifood of IEEE CAS  
2020 TC Member of Flexible Electronics and Display (FED) of IEEE EDS

### **Project Evaluation and Revision Responsibilities**

2021 Scientific Evaluator of Deutsche Forschungsgemeinschaft (DFG)  
2021 Reviewer of H2020 IA Project  
2020 Vice-Chair (Quality Control) of H2020 FET-OPEN RIA Call 2018-2020  
2018 Scientific Evaluator of H2020 ICT-2018-2 Call  
2017 Scientific Evaluator of H2020 FET-OPEN RIA Call 2016-2017

### **Student and Junior Researcher Supervision**

2018 – now Supervisor of 11 PhD students, 1 Assistant Professor, 1 Technologist, 2 Postdocs, and 5 Students (M.Sc. and B.Sc.), as well as Co-supervisor of 3 PhD Students.

### **Radio and TV Service Participation**

2022 Unibz Insights Podcast, Free University of Bozen-Bolzano, Bolzano, Italy  
2021 ORF Südtirol Heute, Bolzano, Italy  
2020 Südtirol Forscht, Radio Südtirol, Bolzano, Italy  
2020 RAI TG Alto Adige and RAI TG Leonardo, Bolzano, Italy

### **Exhibition and Fair Participation**

2022 Festival “Le mille e una Scienza”, Bolzano, Italy  
2022 Maker Fair Rome, Gazometro di Roma, Rome, Italy  
2020 AquaFarm/NovelFarm, Fiera di Pordenone, Pordenone, Italy  
2019 Long Night of Research, Free University of Bolzano-Bozen, Bolzano, Italy

### **School Activity Participation**

2022 Project Week “Rendezvous mit dem Traumberuf”, Free University of Bolzano, Italy  
2022 IEEE WiEDS Video Series on Female in STEM, IEEE EDS, US.  
2019, 2020 School Competition “Il Linguaggio della Ricerca” (with ITIS Da Vinci in Carpi, Italy)

### **Newspaper and Magazine Mentions**

2022 “Wir wollen transversales Wissen und vertikale Kompetenzen vermitteln”, Unibz News  
2021 “Luisa Petti: Reflections from an EDS Young Professional”, IEEE EDS Newsletter  
2021 “Pflanzengesundheit 4.0”, Academia  
2020 “Technologien für die Zukunft”, Dolomiten  
2020 “Technologie per il futuro: ecco il «Senslab»”, Alto Adige Innovazione  
2020 “La maglietta che misura la fatica e le altre invenzioni del Senslab”, Salto.bz  
2020 “Jenseits der Klischees”, Die Südtiroler Frau  
2020 “The use of antibodies on sensors could prevent food poisoning”, Teknosienze.com  
2020 “Sensori e anticorpi per prevenire le intossicazioni alimentari”, Academia  
2020 “Schnelltests gegen Vergiftungen”, Dolomiten  
2020 “Lebensmittelqualität mit Strom messen? Reifetest für neue Methode”, Academia  
2020 “Prämiert”, Südtiroler Wirtschaftszeitung  
2020 “Academia 81: Frau forscht”, Academia  
2020 “Mama ist ein High-Potential”, Salto.bz