

CV Profile

Johannes P. Seif (Ph.D.)

Research interests

In general: materials science, microfabrication, and semiconductor devices. Interest in subjects related to the **transition to sustainable energy sources**, e.g. photovoltaics, batteries, and generation of hydrogen. **Process development** of coating methods (plasma enhanced chemical vapor deposition, PECVD; physical vapor deposition, PVD) or plasma-based surface treatments.

Education

PhD / Materials Science: (01/11/2010- 30/06/2015) - Swiss Federal Institute of Technology Lausanne (EPFL, CH)

Master of Science / Physics: (06/11/2007- 24/07/2009) – Swiss Federal Institute of Technology Zurich (ETHZ, CH)

Bachelor of Science / Physics: (01/09/2004- 06/11/2007) – University of Tübingen (DE) and ETHZ

Sector of activity

Plasma-based coating processes can be applied in photovoltaics (crystalline silicon, thin-film), or any sector that requires functional coatings or surface treatments.

Experience

Postdoc, University of New South Wales (UNSW, Sydney, Australia) – **Tasks:** Management of an Australian Renewable Energy Agency (ARENA) research project to develop PECVD processes for transition metal oxides for photovoltaic applications. Supervision of a PhD student. Communication with industrial partners, acquisition of equipment and consumables. **(24 months)**

Engineer, INDEOtec (Neuchâtel, Switzerland) – **Tasks:** Acceptance tests of PECVD systems, consulting, market research, Enterprise Resource Planning (process management software) optimization, project management, coordination with clients and partner institutions. Development of PECVD processes. **(12 months)**

R&D Engineer, Meyer Burger Research (Hauterive, Switzerland) – **Tasks:** Development of advanced PECVD processes for nanocrystalline silicon layers applied in silicon heterojunction solar cells on an industrial scale. **(6 months)**

(a) PhD and (b) Postdoc, Swiss Federal Institute of Technology Lausanne (EPFL, Switzerland) – **Tasks:** (a) Development of novel materials for silicon heterojunction solar cells (silicon oxide and nanocrystalline silicon); investigation of the temperature impact on the solar cell performance as well as investigation of the charge carrier transport **(57 months)**; (b) Development of high-efficiency silicon heterojunction solar cells (perovskite-silicon tandem devices) and project management (European project: HERCULES). **(9 months)**

Intern, Oerlikon Solar AG (Trübbach, Switzerland) – **Tasks:** Characterization of nanocrystalline silicon layers by ellipsometry and Raman spectroscopy. **(6 months)**

Master of Science, Swiss Federal Institute of Technology Zurich (ETHZ, Switzerland) – Physics. **(58 months)**

Achievements

- **UNSW:** Setup of a PECVD system for new processes and materials for solar cells.
- **INDEOtec:** Successful acceptance tests of two PECVD systems for customers. Automation of procedures in business management system. This significantly helped saving time (est. >90%) and ruled out the risk of errors.
- **Meyer Burger Research:** Development and upscaling to industrial level of advanced PECVD processes applied in so-called tunnel-junction IBC solar cells.
- **Ph.D. at EPFL:** First and co-author of several scientific articles (click here: [Google Citations](#)). Oral presentations at international conferences (list see below). Successful development of PECVD processes for high-efficiency passivated contacts solar cells.

List of oral presentations at international conferences:

J. P. Seif, T. G. Allen, R. Basnet, A. H. T. Le, M. F. Zhang, and Z. Hameiri, "Temperature-dependent Suns-Voc and Suns-iVoc method for advanced characterization of solar cells", APSRC, Canberra, Australia, 2019.

J. P. Seif, A. H. T. Le, T. G. Allen, R. Dumbrell, C. Samundsett, and Z. Hameiri, "Advanced Suns-photoluminescence technique for the optimization of crystalline silicon solar cells", 36th EU PVSEC, Marseille, France, 2019.

J. P. Seif, J. Haschke, J. Cattin, S. De Wolf, and C. Ballif (EPFL, Neuchâtel, CH), Loïc Tous, Patrick Choulat, Monica Aleman Emanuele Cornagliotti, Angel Uruena, Richard Russell, Filip Duerinckx, Jozef Szlufcik (imec, Leuven, BE), Loris Barraud, Jonathan Champlaud, Jacques Levrat, Matthieu Despeisse (CSEM, Neuchâtel, CH), Amir A. Abdallah, Brahim Aissa, Nouar Tabet (QEERI, Doha, QA), "Crystalline silicon solar cells: temperature dependencies and impact of device architecture", 6th SiliconPV, Chambéry, France, 2016.

J. P. Seif, G. Krishnamani, B. Demaurex, S. Martin de Nicolas, N. Holm, C. Ballif, and S. De Wolf, "Silicon heterojunction solar cells: ambient-temperature impact on passivation and performance", 5th SiliconPV, Konstanz, Germany, 2015.

J. P. Seif, A. Descoedres, M. Filipic, M. Topic, F. Smole, Z. C. Holman, S. De Wolf, and C. Ballif, "Amorphous silicon oxide layers: improving silicon heterojunction solar cell performance", MRS Spring Meeting, San Francisco, California, United States of America, 2014.

J. P. Seif, A. Descoedres, Z. C. Holman, S. De Wolf, and C. Ballif, "Thin microcrystalline layers for application in silicon heterojunction solar cells", 25th International Conference on Amorphous and Nano-crystalline Semiconductors (ICANS), Toronto, Ontario, Canada, 2013.

Contact information

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References

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Damien Lachenal (Ph.D.), Head of R&D, Meyer Burger Research, damien.lachenal@meyerburger.com

Prof. Christophe Ballif, Head of PV-Lab, EPFL, christophe.ballif@epfl.ch