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Laval University,  
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PhD of plasma physics with a strong background in material design and characterization, coatings, surface modifications, application of plasma in solar cells, and biomedical devices.

## EDUCATION

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**Doctor of applied physics** Masaryk University, Brno, Czech Republic 2016 - 2019  
**Master of applied physics** Beheshti University, Tehran, Iran 2012 - 2014  
**Bachelor of applied physics** Orumieh University, Orumieh, Iran 2006 - 2011

## WORK EXPERIENCE

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**Postdoctoral fellow** Laval University, Quebec, Canada 2021 -  
**Postdoctoral fellow** Masaryk University, Brno, Czech Republic 2020 - 2021  
**Research assistant** Masaryk University, Brno, Czech Republic 2017 -2020  
**Visitor researcher** FAU, Nürnberg, Germany 2018  
**Internship** DTU, Roskilde, Denmark, 2018

## SKILLS

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- **Coating techniques:** ALD, PLIID, PECVD, PVD (Magnetron sputtering), spin-coating, Ink-jet printing, slot-die coating, solar cell fabrication.
- **Characterization techniques:** Scanning electron microscopy (SEM), FIB-SEM, energy dispersive x-ray spectroscopy (EDX), Atomic force microscopy (AFM), X-ray diffraction (XRD), X-ray photoelectron spectroscopy, Raman, Optical emission spectroscopy (OES), Photoluminescence, UV-Vis spectroscopy, J-V and EIS characterization.
- **Computer skills and data analysis:** Origin Lab, Excel, Casa XPS, HighScore XRD, Gwyddion, .
- **Other skills:** Scientific writing, Experiment design and project management, problem solving and critical thinking.

## PUBLICATIONS

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- **M. Shekargoftar**, J. Pospisil, M. Kratochvíl, J. Vida, P. Souček, and T. Homola, "Low-Temperature and Rapid Deposition of an SnO<sub>2</sub> Layer from a Colloidal Nanoparticle Dispersion for Use in Planar Perovskite Solar Cells," Energy Technol., vol. 9, no. 5, p. 2001076, **2021**, doi: <https://doi.org/10.1002/ente.202001076>.
- **M. Shekargoftar**, J. Kelar, R. Krumpolec, J. Jurmanova, and T. Homola, "A Comparison of the Effects of Ambient Air Plasma Generated by Volume and by Coplanar DBDs on the Surfaces of PP/Al/PET Laminated Foil," IEEE Trans. Plasma Sci., vol. 46, no. 10, pp. 3653–3661, **2018**, doi: 10.1109/TPS.2018.2861085.
- **M. Shekargoftar**, J. Pospisil, J. Dugacek, M. Weiter, and T. Homola, "Surface Property Tuning of Methylammonium Lead Iodide by Plasma for Use in Planar Perovskite Solar Cells," ACS Omega, **2020**, doi: 10.1021/acsomega.0c02179.
- **M. Shekargoftar** and T. Homola, "A New Approach to the Crystallization of Perovskite Films by Cold Hydrogen Atmospheric Pressure Plasma," Plasma Chem. Plasma Process., no. 0123456789, **2020**, doi: 10.1007/s11090-020-10059-1.
- **M. Shekargoftar**, P. Dzik, Z. Ďurašová, M. Stupavská, D. Pavlíňák, and T. Homola, "Mineralization of flexible mesoporous TiO<sub>2</sub> photoanodes using two low-temperature dielectric barrier discharges in ambient air," Contrib. to Plasma Phys., vol. 59, no. 1, pp. 102–110, **2019**, doi: 10.1002/ctpp.201700213.
- **M. Shekargoftar**, J. Jurmanov, and T. Homola, "A Study on the Effect of Ambient Air Plasma Treatment on the Properties of Methylammonium Lead Halide perovskite films," Metals (Basel), vol. 9, no. 9, p. 991, **2019**, doi: <https://doi.org/10.3390/met9090991>.

- **M. Shekargoftar**, R. Krumpolec, and T. Homola, "Enhancement of electrical properties of flexible ITO/PET by atmospheric pressure roll-to-roll plasma," *Mater. Sci. Semicond. Process.*, vol. 75, no. August **2017**, p. revision submitted, 2017, doi: 10.1016/j.mssp.2017.11.022.
- M. K. A. Mohammed and **M. Shekargoftar**, "Surface treatment of ZnO films with carbon nanotubes for efficient and stable perovskite solar cells," *Sustain. Energy Fuels*, vol. 5, no. 2, pp. 540–548, **2021**, doi: 10.1039/d0se01493a.
- G. Nagaraj, M.K.A. Mohammed, **M. Shekargoftar**, P. Sasikumar, P. Sakthivel, G. Ravi, M. Dehghanipour, S. Akin, and A.S. Shalan, "High-performance perovskite solar cells using the graphene quantum dot–modified SnO<sub>2</sub>/ZnO photoelectrode," *Mater. Today Energy*, vol. 22, p. 100853, **2021**, doi: 10.1016/j.mtener.2021.100853.
- J. Kelar, **M. Shekargoftar**, R. Krumpolec, and T. Homola, "Activation of polycarbonate (PC) surfaces by atmospheric pressure plasma in ambient air," *Polym. Test.*, vol. 67, **2018**, doi: 10.1016/j.polymertesting.2018.03.027.
- M. Stiborek, J. Preisler, **M. Shekargoftar**, V. Kanický, and J. Kelar, "Cold Plasma: The Way to Improve the Repeatability of Sald ICP-MS Analysis," *Hungarian J. Ind. Chem.*, vol. 46, no. 1, pp. 19–22, **2018**, doi: 10.1515/hjic-2018-0005.
- T. Homola, Z. Ďurašová, **M. Shekargoftar**, P. Souček, and P. Dzik, "Optimization of mesoporous TiO<sub>2</sub> photoanode prepared by inkjet printing and low-temperature plasma processing," *Plasma Chem. Plasma Process.*, no. 0123456789, **2020**, doi: 10.1007/s11090-020-10086-y.
- T. Homola, J. Pospisil, **M. Shekargoftar**, T. Svoboda, M. Hvojník, P. Gemeiner, M. Weiter, and P. Dzik., "Low-temperature (70 °C) ambient air plasma-fabrication of inkjetprinted mesoporous TiO<sub>2</sub> flexible photoanodes," *Flex. Print. Electron.*, vol. 2, no. 3, 2017, doi: 10.1088/2058-8585/aa88e6.
- T. Homola J. Pospisil, **M. Shekargoftar**, T. Svoboda, M. Hvojník, P. Gemeiner, M. Weiter, P. Dzik., "Perovskite Solar Cells with Low-Cost TiO<sub>2</sub>Mesoporous Photoanodes Prepared by Rapid Low-Temperature (70 °c) Plasma Processing," *ACS Appl. Energy Mater.*, **2020**, doi: 10.1021/acsaem.0c02144. Mustafa K A Mohammed, Majid S Jabir, Haider G Abdulzahraa, Safa H Mohammed, Waleed Khaild Al-azzawi, Duha S Ahmed, Sangeeta Singh, Anjan Kumar, S Asaithambi, and **Masoud Shekargoftar**. Introduction of cadmium chloride additive to improve the performance and stability of perovskite solar cells. *RSC Advances*, pages 20461–20470, **2022**, doi: 10.1039/d2ra03776a.
- S. Gambaro, L. Nascimento, **M. Shekargoftar**, S. Ravanbakhsh, V. Sales, C. Paternoster, M. Bartosch, F. Witte, D. Mantovani, "Characterization of a Magnesium Fluoride Conversion Coating on Mg-2Y-1Mn-1Zn Screws for Biomedical Applications", *MDPI Materials*, **2022**, doi: 10.3390/ma15228245.

## TEACHING AND MENTORSHIP EXPERIENCE

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- Techniques for materials characterizations
- Surface modification to improve implants performances
- Basic physics
- Undergraduate Labs (Electronics)
- Mentorship of graduate students on using instruments, experimental techniques, and presentation skills
- Co-supervising of the PhD thesis

## Organizer and presenter of seminars and workshops

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- **Seminar for CERMA:** *Photovoltaic cell: a great tool for sustainable development: Prospect and limitation, Quebec, Canada (October 2021).*
- **Workshop:** *How to deconvolute X-ray photoelectron spectroscopy spectra: an introduction to CASA software, Quebec, Canada (November 2021).*
- **Workshop:** *Surface modification of biomaterials and medical devices by using plasma technology , Quebec, Canada (monthly, July-September 2022).*

## Selected Awards

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### Brno Phd talent

December 2016

Awarded based on competitive proposal: "Investigation of optimizing performance and cost of OPV by using atmospheric plasma"

## SELECTED CONFERENCES

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- **CIP 2017**, *Two steps roll-to-roll plasma processing to optimize inkjet printed TiO<sub>2</sub> photoanode for flexible electronics. 21st Colloquium on Plasma processes , Nice, France.*

- **CESPC 2017**, *Low-temperature plasma processing of inkjet printed TiO<sub>2</sub> photoanodes. 7th Central European Symposium on Plasma Chemistry, Sv. Martin, Croatia.*
- **PSCO 2018**, *Low-temperature ambient air plasma treatment of mixed-halide perovskite films, 4th International Conference on Perovskite Solar Cells and Optoelectronics, Lausanne, Switzerland.*
- **IDTechEx Printed electronics 2019**, *Atmospheric pressure plasma processing of the nanostructured semiconductors, Berlin, Germany.*
- **IV PV 2019**, *Atmospheric plasma engineering of thin films for next generation flexible solar cells, Next Generation IV PV Materials, Groningen, Netherlands.*
- **PSCO 2019**, *Low-cost and high-speed atmospheric plasma engineering of thin films for roll-to-roll manufacturing of perovskite solar cells, 5th International Conference on Perovskite Solar Cells and Optoelectronics, Lausanne, Switzerland.*
- **NanoCon 2019**, *Low-cost and high-speed atmospheric plasma processing of perovskite thin films, 11th International Conference on nanomaterials, Brno, Czech Republic.*
- **PSE 2020**, *Atmospheric pressure plasma engineering of perovskite films for highly-efficient perovskite solar cells, Workshop on plasma-based synthesis of nanomaterials, Prague, Czech Republic.*
- **Biometal 2021**, *13th Symposium on Biodegradable Metals for Biomedical Applications, Virtual conference.*
- **Biometal 2022**, *Surface modification of a biodegradable Mg-Y-Zn-Mn alloy by oxygen plasma immersion ion implantation, Alicante, Spain.*