



# Ing. Petr Hauschwitz, Ph.D., MBA

Team leader – laser micromachining

## CONTACTS

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**HiLASE Centre**  
Institute of Physics of the  
Czech Academy of Sciences  
Za Radnici 828  
252 41 Dolni Brezany  
Czech Republic

**H-INDEX:** 9

## LANGUAGES:

English  
Czech

## EDUCATION AND ACADEMIC DEGREES

**Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Czech Republic**  
2016 – 2018

M.Sc. in Physical Engineering – Laser technology

**Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Czech Republic**  
2019 – 2021

Ph.D. in Applied Physics - Large-scale surface functionalization

**European School of Business & Management, Czech Republic**  
2021 – 2022

MBA programme

## ACADEMIC POSITIONS

**Institute of Physics, Czech Academy of Sciences, HiLASE, Czech Republic – Team leader**

2019 – present

- Development and optimization of new and innovative processes in laser micromachining and surface functionalization.
- Scientific leadership and project management

**Institute of Physics, Czech Academy of Sciences, HiLASE, Czech Republic – Researcher**

2016 – 2018

- Optimization of laser cutting, drilling and cleaning of metallic materials, dielectrics and composite materials

## POSTDOCTORAL AND RESEARCH STAYS

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### ALPhANOV Technology Center (Bordeaux, France) – Senior Researcher

Oct 2022

- Planning of joint involvement in European projects; Management discussions regarding project management, technology transfer, quality and strategic management, regional ecosystem building and industry cluster management etc.

### Fraunhofer IWS (Dresden, Germany) – Research Assistant

Jan 2019 – Feb 2019

- Development and optimization of direct laser interference strategy for surface functionalization of carbon-fiber reinforced composite materials

### Gwangju Institute of Science and Technology (GIST, South Korea) – Research Assistant

June 2017 – Aug 2017

- Optimization of laser cutting, drilling of composite materials (C-PEEK, C-PPS) with pulsed ns IR and UV laser systems

## FELLOWSHIPS AND AWARDS

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- **Werner von Siemens price** for the best PhD thesis (2022)
- **Forbes Czech, 30 under 30** for advances in multi-beam micromachining (2021)
- **Certificate of Merit, Milan Odehnal's price, Czech Physical Society** (2020)

## TEACHING ACTIVITIES (IF APPLICABLE)

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### Supervision of graduate students and postdoctoral fellows

2021 - present

- 1x Bachelor student, 2x Master students, 2x PhD students

*Supervised students:*

Student	Název práce	Typ práce	Univerzita	Školitel	Školitel specialista
Tibor Košťál - odevzdáno	Analyza parametrů integrity povrchu funkčních mikrostruktur připravených pomocí laserových technologií	Výzkumný úkol	CVUT FJFI	Ing. Petr Hauschwitz, Ph.D.	Ing. Jiří Čapek, Ph.D.,
Martin Procházka	Justážní metody optických přístrojů	PhD práce	CVUT FS	doc. Ing. Jan Hošek, Ph.D.	Ing. Petr Hauschwitz, Ph.D.
Ivan Tarant	Periodické nanostruktury proti padělení, strukturální barvy a hologramy	PhD práce	CVUT FJFI	Ing. Alexander Jančárek, Csc	Ing. Petr Hauschwitz, Ph.D.
Kryštof Kobliha	Samočistící povrchy pomocí laserem vytvořených mikro a nanostruktur	BP práce	CVUT FJFI	Ing. Petr Hauschwitz, Ph.D.	Ing. Alexander Jančárek, Csc
Daniel Eger	Nanostrukturování povrchu laserem pro medicínské aplikace	DP práce	CVUT FS	Ing. Libor Beránek, Ph.D.	Ing. Petr Hauschwitz, Ph.D.

### Thesis reviewed:

Jméno studenta	Typ práce	Název práce	Univerzita	Vedoucí	Konzultant	Datum	Školní rok práce	Známka
Filip Vitha	Bakalářská	Mikroobrábění femtosekundovým laserem	CVUT FJFI	Ing. Michal Nevrkla, Ph.D	Ing. Petr Gavrilov, CSc	červenec 19	2018/2019	Výborně A
Bc. Jiří Chábera	Diplomová	Úprava povrchu řezných materiálů laserem	CVUT FS	Ing. Pavel Zeman, Ph.D	Ing. Tomáš Primus	srpen 21	2020/2021	Dobře C
Bc. Filip Vitha	Diplomová	Laserové mikroobrábění struktur plazmových vlnovodů	CVUT FS	Ing. Michal Nevrkla, Ph.D	Ing. Alexandr Jančárek, CSc.	srpen 21	2020/2022	Výborně A

## POPULARISATION OF RESEARCH (IF APPLICABLE)

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YouTube channel - Introduction to laser technology and practical aspects of laser machining

Appearances on Czech TV (CT1) and radio (Český rozhlas)

## SKILLS & PROJECT MANAGEMENT EXPERIENCE – COMPETITIVE FUNDING

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- Leadership skills gained as Team leader of laser micromachining at HiLASE Centre
- Organisation skills gained through working experience as an activity and work package leader in various national and international research & development projects:
  - o *HiLASE Centre of Excellence, 2017-2022, 45 Mio. EUR*
  - o *HiLASE: Superlasers for the real world, 2016-2020, 6 Mio. EUR*
  - o *TN01000008 NCK CEPO – New methods for laser micromachining*
  - o *TM01000021 Delta2 - Development of non-linear absorption driven optic system and process for high throughput TGV formation*

## LIST OF INVITED LECTURES (SELECTED)

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- P. Hauschwitz: Fast large-area multi-beam micro/nanostructuring at HiLASE, The 7th Industrial Laser Applications Symposium (ILAS 2021), 2021 March 24-25, Keynote lecture.
- P. Hauschwitz: High-speed high-resolution multi-beam micromachining with ultrashort pulsed lasers. Laser Applications Conference, Optical Society of America Laser Congress, 2020 October 13-16, p. LW4B. 3, Invited lecture.

## OVERVIEW OF SCIENTIFIC OUTPUTS

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- First author in peer-reviewed international journals with impact factor: 10
- Citations in WOS (not counting self-citations): 121
- Invited lectures at international conferences and universities: 2

- H-index: WOS 8; Google Scholar (GS) 9; i10-index (GS) 9

## LIST OF PUBLICATIONS (TOP 5)

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- HAUSCHWITZ, P., et al. *LIPSS-based functional surfaces produced by multi-beam nanostructuring with 2601 beams and real-time thermal processes measurement. Scientific reports, 2021, DOI: <https://doi.org/10.1038/s41598-021-02290-3>*
- HAUSCHWITZ, Petr, et al. *Towards Rapid Fabrication of Superhydrophobic Surfaces by Multi-Beam Nanostructuring with 40,401 Beams. Nanomaterials, 2021, 11.8: 1987, DOI: <https://doi.org/10.3390/nano11081987>*
- HAUSCHWITZ, P., et al. *Fabrication of functional superhydrophobic surfaces on carbon fibre reinforced plastics by IR and UV direct laser interference patterning. Applied Surface Science, 2019, 144817., DOI: <https://doi.org/10.1016/j.apsusc.2019.144817>*
- HAUSCHWITZ, P., et al. *Hydrophilic to ultrahydrophobic transition of Al 7075 by affordable ns fiber laser and vacuum processing. Applied Surface Science, 2019, 144523., DOI: <https://doi.org/10.1016/j.apsusc.2019.144523>*
- HAUSCHWITZ, Petr, et al. *Micromachining of Invar with 784 Beams Using 1.3 ps Laser Source at 515 nm. Materials, 2020, 13.13: 2962., DOI: <https://doi.org/10.3390/ma13132962>*

## LIST OF APPLIED RESEARCH RESULTS

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- RIV/47677023: (Ztech) Advanced laser processing by beam profile transformation
- RIV/68378271: (Jimp) Anti-reflection nanostructures on tempered glass by dynamic beam shaping
- National patent LU102198: A method for extending fatigue life of a turbine blade affected by pitting and product thereof

# GROUNDBREAKING FINDINGS AND EXPERTIZE

## INDEPENDENT RESEARCH - GROUNDBREAKING FINDINGS AND NEW METHODOLOGIES

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Major groundbreaking contributions to the research field: Development of multi-beam technology for large-scale nanostructuring – a world record in productivity of nanostructuring & number of beams simultaneously nanostructuring material – 40 000 beams.