# Jan Nikl

*Curriculum Vitae*

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## Education

2017–2022 **Doctoral degree**, *Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague*, Physical engineering.
- thesis: Modelling of non local energy transport in laser plasma
- supervisor: doc. Ing. M. Kuchařík, Ph.D., supervisor specialist: Dr. S. Weber

2015–2017 **Master's degree**, *Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague*, Computational Physics, (graduation with honors).

2012–2015 **Bachelor's degree**, *Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague*, Computational Physics.

## Work experience

2024–now **Postdoctoral scientist**, *Numerical Analysis & Simulations Group, Center for Applied Scientific Computing, Lawrence Livermore National Laboratory, CA, USA*.

2022–2023 **Postdoctoral scientist**, *Department of Matter under Extreme Conditions and Department of Professional Support, Center for Advanced Systems Understanding (CASUS), Helmholtz-Zentrum-Dresden-Rossendorf, Germany*.

2017–2022 **Junior researcher**, *Department of Plasma Physics and Ultra-high Intensity Interactions, ELI Beamlines, Institute of Physics, Czech Academy of Sciences*.

2017–2022 **Junior researcher**, *Department of Laser Plasma, Institute of Plasma Physics, Czech Academy of Sciences*.

2019–2020 (6 months) **Guest scientist**, *Center for Advanced Systems Understanding (CASUS), Helmholtz-Zentrum-Dresden-Rossendorf, Germany*, internship.

summer 2012, 2013/14/15 **Measurement software programmer**, *Institute of Physics, Czech Academy of Sciences*, summer job.

summer 2011 **Measurement automation software programmer**, *Nuclear Physics Institute, Czech Academy of Sciences*, summer job.

2010–2012 **Teaching of the programming hobby class**, *ZŠ Červený Vrch*.

## Awards

2020 Honourable mention – Milan Odehnal Prize

2018 Best poster award – 6. European Seminar on Computing

2018 Best masters's thesis – Dean's award - NUVIA

## Other activities

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|---|---|
| 2023 | **Summer student supervisor**, *Convective flows in Extended MHD*, J. Löffelmann, HZDR summer school. |
| 2022 | **Summer student supervisor**, *MHD simulations of the laser-target interaction*, J. Löffelmann, ELI BL summer school. |
| 2017-2022 | **SPIE student chapter officer**, *Czech Technical Univ. in Prague Chapter*. |
| 2017-2022 | **Tutorials teacher**, *Introduction to Unix*, FNSPE CTU. |
| 2021 | **Summer student supervisor**, *Laser ray-tracing for plasma hydrodynamics*, M. Šach, ELI BL summer school. |
| 2019-2021 | **Master thesis advisor**, *Hydrodynamic simulations of X-ray generation and propagation in laser-produced plasmas*, M. Šach, FNSPE CTU. |
| 2018-2019 | **Bachelor project advisor**, *Hydrodynamic plasma simulations for X-ray laser realization*, M. Šach, FNSPE CTU. |

## Courses and trainings

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|---|---|
| 2023 | High Energy Density Science Summer School – UC San Diego |
| 2018, 2019 | Erasmus+ PowerLaPs – High Power Laser Plasma Physics |
| 2017 | Erice Summer School – Atoms and Plasmas in Super-Intense Laser fields |
| 2016 | ELI Summer School |
| 2016 | KU Leuven – ATHENS |
| 2010–2012 | Cisco Networking Academy |

## Skills and abilities

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| Programming | C, C++, C#, Fortran, Java, Assembler (x86, PIC), Python, PHP, Matlab, LabVIEW, Maple, HTML, CSS |
| Parallelization | MPI, OpenMP, CUDA |
| 3D modeling | certificates: AutoCAD 2011 CZ – 3D documentation, Inventor Professional 2011 CZ |
| Networking | certificates: CCNA Exploration: Network Fundamentals, CCNA Exploration: Routing Protocols and Concepts |
| Office software | MS Office, Open/LibreOffice, LaTeX |
| Operating systems | GNU/Linux, MS Windows |

## Languages

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|---|---|
| Czech | Mother tongue |
| English | Advanced |
| German | Lower intermediate |

## Selected publications

- J. Nikl, M. Kuchařík, and S. Weber. High-order curvilinear finite element magneto-hydrodynamics I: A conservative Lagrangian scheme. *Journal of Computational Physics*, **464**, 111158 (2022).
- J. Nikl, I. Göthel, M. Kuchařík, S. Weber, and M. Bussmann. Implicit reduced Vlasov–Fokker–Planck–Maxwell model based on high-order mixed elements. *Journal of Computational Physics*, **434**, 110214 (2021).
- J. Nikl, M. Kuchařík, J. Limpouch, R. Liska, and S. Weber. Wave-based laser absorption method for high-order transport–hydrodynamic codes. *Advances in Computational Mathematics*, **45**(4), 1953-1976 (2019).
- J. Nikl, M. Holec, M. Zeman, M. Kuchařík, J. Limpouch, and S. Weber. Macroscopic laser-plasma interaction under strong non-local transport conditions for coupled matter and radiation. *Matter and Radiation at Extremes* **3**(3), 110-126 (2018).
- M. Holec, J. Nikl, and S. Weber. Nonlocal transport hydrodynamic model for laser heated plasmas. *Physics of Plasmas* **25**(3), 032704 (2018).
- M. Holec, J. Nikl, M. Vranic, and S. Weber. The effect of pre-plasma formation under nonlocal transport conditions for ultra-relativistic laser-plasma interaction. *Plasma Physics and Controlled Fusion*, **60**(4), 044019 (2018).

## Interests

- philosophy, psychology
- hiking

## References

- **Aaron Fisher (group leader)**
  Group Leader of Numerical Analysis & Simulations Group
  Center for Applied Scientific Computing
  Lawrence Livermore National Laboratory
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- **Dr. Milan Kuchařík (thesis supervisor)**
  Associate professor
  Department of Physical Electronics
  Faculty of Nuclear Sciences and Physical Engineering
  Czech Technical University in Prague
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