

Aleš Podolník

Curriculum Vitae

Prague, Czech Republic
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I like to do stuff.
The stuff should not be boring.
This haiku is bad.

Work Experience

My scientific work is aimed at study of plasma-wall interaction via computer simulation, especially magnetic pre-sheath physics and its interplay with charged surfaces as well as the application of the model as a data source for interpretation of experiments. My main tool is the 2D3V PIC model SPICE2, which I partly co-develop within the scope of the IPP CAS. I also take part in the institute administration, especially as a liaison between students and the resource providers. I regularly take part in EUROfusion related tasks in work packages Plasma-wall interaction and Tokamak exploitation.

- 2024–present **Researcher**, *Institute of Plasma Physics of the Czech Academy of Sciences*, Prague.
COMPASS RI3, 2024+, Investment procurement for large research infrastructure COMPASS (PI, management)
- 2019–2024 **Postdoc**, *Institute of Plasma Physics of the Czech Academy of Sciences*, Prague.
Simulations of edge plasma physics using kinetic (SPICE) and fluid models (SOLPS-ITER).
Plasma-PEPSC, 2021+, Porting and application of plasma computational models for exascale computing (co-investigator, modeller, SW engineering)
EUROfusion WP PWIE, 2021+, Simulations of heat flux on PFC components in tokamak WEST (co-investigator, modeller)
GA20-28161S, Kinetic study of boundary plasma in COMPASS and COMPASS-U tokamaks, 2020–2022 (co-investigator, modeller)
EUROfusion WP TRED, 2020+, Ph.D. student resources management (administrator)
EUROfusion WP TE, 2019+, Heat and particle flux simulations for plasma-facing components (co-investigator, modeller)
COMPASS-U, 2019–2023, Simulations of current collection by electric probes in aid of the probe design (co-investigator, modeller)
- 2012–2019 **Ph.D. student**, *Institute of Plasma Physics of the Czech Academy of Sciences*, Prague.
Data analysis from simulated plasma probe diagnostics and plasma-surface interaction using particle-in-cell model. Co-development of simulation code SPICE2 and SPICE3 (parallel Poisson equation solver, Fortran 95).
COMPASS-U, 2017–2019, Simulations of current collection by electric probes in aid of the probe design (co-investigator, modeller)
ITER contract ITER/CT/14/4300001069, 2016–2017, ITER contract on simulation of exposed leading edges of plasma-facing components (co-investigator, SW engineering)

- 2011–2015 **Software engineer**, *4mobile s.r.o.*, Prague.
Developer of mobile applications and client server backend/frontend for domestic and international clients and in-house projects.
- BookJet Trafika Editor** – Server/client framework for e-book publication. Browser-based UI (Javascript – ExtJS) & PDF converter tool (ASP.net).
- Webview & JS applications** – *Groupe SEB* trade catalogue, *KPMG* form processing app.
- Native UI applications** – Children book for *Hallmark UK* (iOS), *KPMG* app port for Blackberry etc.
- Various proof of concept projects** – Adobe After Effects/Amazon AWS video rendering platform, augmented reality, image recognition.

Volunteering

- 2007–present **Organizer**, *Czech puzzlehunts*, Prague.
Member of a production team of acclaimed puzzlehunts in Prague and Brno including *Krtí norou* (2008–2016), *Matrix* (2014–2017, team leader of the last issue), *Navíc* (2018–2023) and *Puzzled Pint* (2018–present).
- 2007–2010 **Team leader**, *FYKOS*, Prague.
Chief organizer of physics correspondence course and competition for high school students. Managed a mid-sized team for 3 year-long rounds of the contest, 2 national rounds of on-site team contest Fyziklání, and several training camps for talented students.
- 2006–2019 **LOC and staff member**, *MFF UK*, *IPP CAS*, Prague, Brno.
Support staff at various conferences (SOFT 2017, FuseNet Ph.D. Event 2016) and university events (open days 2006–2010, Fyziklání and Náboj team contests 2007–2019). Team member at FYKOS.

Education

- 2019 **Ph.D. in Physics of Plasmas and Ionized Media**, *Charles University*, Prague.
Thesis: Study of probe diagnostics of tokamak edge plasma via computer simulation, supervisor: doc. RNDr. Radomír Pánek, Ph.D.
- 2012 **Master's degree in Physics of Surfaces and Ionized Media**, *Charles University*, Prague.
Thesis: Source of cold atomic hydrogen, supervisor: doc. RNDr. Radek Plail, Ph.D.
- 2009 **Bachelors's degree in General Physics**, *Charles University*, Prague.
Thesis: On the motion of charged particles in the magnetic field: the electron spectrometer, supervisor: prof. RNDr. Juraj Glosík, DrSc.
- 2006 **Gymnázium se zaměřením na matematiku**, *Gymnázium Brno, tř. Kpt. Jaroše 14*, Brno.

Publications

H-index 11 (as of 2/2024)
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profile

First author

- 2019 Podolník A. et al., Interpretation of flush-mounted probe current-voltage characteristics using four-parametric fits, *Plasma Physics and Controlled Fusion* **61** 105011, <https://doi.org/10.1088/1361-6587/ab3de8>

2018 Podolník A. et al., 3D particle-in-cell modeling of Langmuir probe effective collecting area in magnetized plasma, *Plasma Physics and Controlled Fusion* **60** 085008, <https://doi.org/10.1088/1361-6587/aac701>

Computer Skills

While I have never studied Computer Science or Engineering, I gained nontrivial knowledge of several languages and environments via hands-on experience.

Github <https://github.com/uberales> contains mostly personal fun projects

Languages *Using daily:* Python, Fortran 95, Matlab
Used to use: C#, Objective-C, Javascript (*ExtJS*, *jQuery*), Java, PHP, Pascal, HTML/CSS, Java, MySQL/MS SQL
Met along the way: lua, C/C++, XML

OS Linux, Windows (advanced), OS X (user)

Software Matlab, L^AT_EX, git, bash, gimp, Inkscape (user)

Languages

Czech native speaker
English upper intermediate
French basics
German basic words and phrases only

Interests

Puzzlehunts *Winner of several renowned Czech over-night outdoor events.*

Public outreach activities *Occasional tour guide at open doors at the Academy.*

Classical music *Opera listener and guitar player.*

Arduino *Tinkering with circuit boards.*

Art and architecture *Graduate of 2nd cycle elementary art school.*