

RNDr. Petr Cejpek, PhD.

Permanent residence:

Kaštanova 688
Milovice
289 24
Czech Republic

Birthdate: 21.6.1991

Phone: (+420) 724 307 827

E-mail: petr.cejpek@centrum.cz

Education

16/09/2021 – graduate of the doctoral study at Faculty of Mathematics and Physics, dissertation thesis topic: *"Study of indium doped shape-memory alloy Ni₂MnGa"*

11/06/2015 – graduate of the master specialization Physics of the condensed systems and materials at Faculty of Mathematics and Physics, master thesis topic: *"X-ray diffraction and diffuse scattering from Heusler alloys"*

19/06/2013 – graduate of the bachelor specialization General Physics at Faculty of Mathematics and Physics, bachelor thesis topic: *"Diffuse X-ray reflection from rough multilayers"*

29/09/2010 – start of the study at Faculty of Mathematics and Physics, Charles University, Prague

Professional experience

01/09/2025-today – scientific worker at Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic

01/09/2022-31/08/2025 – scientific worker at Institute of Materials Science, TU Bergakademie Freiberg, Freiberg, Germany

01/02/2017-31/08/2022 – scientific worker at Department of Condensed Matter Physics, Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic

Vocational specialization

Preparation of compounds by melting in a mono-arc furnace

Preparation of single-crystalline samples by Bridgman method

Examination and characterization of the structure, defects and residual stresses by X-ray diffraction methods

Examination of microstructure by scanning electron microscopy

X-ray reflectivity and EXAFS

Examination of the surface by AFM method

Measurement of physical volume properties with PPMS devices

Data processing, refinement and programming in *MatLab*

3D modelling in Blender and 3D printing

Projects and grants

Deutsche Forschungsgemeinschaft (DFG), project n. 46910648: *Control of the microstructure of thin multilayer systems by ultrashort pulsed laser irradiation – process understanding by complementary in situ and ex-situ characterizations and multiscale simulations*, 2022-2025, researcher

Sonderforschungsbereich (SFB) 920: *Multifunctional Filters for Metal Melt Filtration – a Contribution to Zero Defect Materials*, 2022-2023, researcher

OPVVV CZ.02.1.01/0.0/0.0/15_003/0000485: *Nanomaterials Centre for Advanced Applications (NANOCENT)*, 2018-2022, researcher

Charles University Grant Agency (GAUK) project n. 244217: *Preparation and study of the properties of shape memory alloys Ni_2MnGa doped with Indium*, 2017-2019, principal investigator

Research outputs and publications

Articles in the impacted journals:

P. Cejpek, M. Motylenko and D. Rafaja, *Lattice strain relaxation in thin Mo films grown heteroepitaxially on MgO single crystals*, Journal of Applied Crystallography, 59: 190-205, 2026, doi: 10.1107/S1600576726000233

T. Pflug, P. Cejpek, M. Olbrich, C. Wüstefeld, M. Ernstberger, M. Motylenko, D. Rafaja, A. Horn. *Transient ablation topography of a thin chromium film after ultrashort pulsed laser irradiation in the spallation and phase explosion regime*, Optics & Laser Technology, 172: 110540, 2024, doi: 10.1016/j.optlastec.2023.110540.

P. Cejpek, D. Drozdenko, K. Mathis, R. H. Colman, M. Dopita, L. Straka, O. Heczko. *Exceptionally small Young modulus in 10M martensite of Ni-Mn-Ga exhibiting magnetic shape memory effect*. Acta Materialia, 25715:119133, 2023, doi: 10.1016/j.actamat.2023.119133.

D. Kral, P. Cejpek, J. Kudrnovsky, V. Drchal, L. Beran, E. Vilanova, J. Zazvorka, R. Antos, J. Hamrle, M. Veis. *Analysis of atomic ordering of the ferromagnetic $\text{Co}_2\text{Fe}(\text{Ga}_{0.5}\text{Ge}_{0.5})$ Heusler compound using spectroscopic ellipsometry*. Physical Review B, 106:144102, 2022, doi: 10.1103/PhysRevB.106.144102.

M. Klicpera, T. Kovalyuk, K. Drastichova, P. Cejpek, K. Uhlirova, M. Kratochvilova, B. Vondrackova, J. Valenta, R. H. Colman. *Synthesis and characterisation of Fe-substituted $\text{Ni}_{50}\text{Mn}_{25}\text{Fe}_x\text{Ga}_{25-x}$ single crystals – Development of the phase transformations with Fe content*. Journal of Alloys and Compounds, 908:164543, 2022, doi: 10.1016/j.jallcom.2022.164543.

P. Cejpek, P. Proschek, L. Straka, O. Heczko. *Dependence of martensite transformation temperature on magnetic field in Ni_2MnGa and $\text{Ni}_2\text{MnGa}_{0.95}\text{In}_{0.05}$ single crystals*. Journal of Alloys and Compounds, 908:164514, 2022, doi: 10.1016/j.jallcom.2022.164514.

K. Fekete, D. Drozdenko, P. Cejpek, P. Dobron, J. Vesely, M.Y. Yamasaki, Y. Kawamura. *Thermal stability of the microstructure of rapidly solidified ribbon-consolidated $\text{Mg}_{97.94}\text{Zn}_{0.56}\text{Y}_{1.5}$ alloy*. Materials Characterization, 183:111618, 2022, doi: 10.1016/j.matchar.2021.111618.

P. Dolezal, P. Cejpek, S. Tsutsui, K. Kaneko, D. Legut, K. Carva, P. Javorsky. *Lattice dynamics in CePd_2Al_2 and LaPd_2Al_2* . Scientific Reports, 11(1):20878, 2021, doi: 10.1038/s41598-021-99904-7.

K. K. Tikuisis, J. Wyzula, L. Ohnoutek, P. Cejpek, K. Uhlirova, M. Hakl, C. Faugeras, K. Vyborny, A. Ishida, M. Veis, M. Orlita. *Landau level spectroscopy of the PbSnSe topological crystalline insulator*. Physical Review B, 103(15):155304, 2021, doi: 10.1103/PhysRevB.103.155304.

T. Krajnak, M. Janecek, P. Minarik, J. Vesely, P. Cejpek, J. Gubicza, P.T. Hung, D. Preisler, F. Novy, A.G. Raab, G.I. Raab, R. Asfandiyarov. *Microstructure Evolution and Mechanical Properties of cp-Ti Processed by a Novel Technique of Rotational Constrained Bending*. Metallurgical and Materials Transaction A – Physical Metallurgy and Materials Science, 50(5):1665 – 1678, 2021, doi: 10.1007/s11661-021-06157-0.

P. Cejpek, P. Dolezal, P. Opletal, J. Valenta, K. Vlaskova, and M. Dopita. *Temperature versus composition phase diagram and temperature evolution of structure and modulation of $Ni_2MnGa_{1-x}In_x$ single crystals*. Journal of Alloys and Compounds, 855:157327, 2021, doi: 10.1016/j.jallcom.2020.157327.

R. Silber, O. Stejskal, L. Beran, P. Cejpek, R. Antos, T. Matalla-Wagner, J. Thien, O. Kuschel, J. Wollschlager, M. Veis, T. Kuschel, J. Hamrle. *Quadratic magneto-optic Kerr effect spectroscopy of Fe epitaxial films on MgO(001) substrates*. Physical Review B, 100(6):064403, 2019, doi: 10.1103/PhysRevB.100.064403.

P. Cejpek, L. Straka, M. Veis, R. Colman, M. Dopita, V. Holy, and O. Heczko. *Rapid floating zone growth of Ni_2MnGa single crystals exhibiting magnetic shape memory functionality*. Journal of Alloys and Compounds, 775:533 – 541, 2019, doi: 10.1016/j.jallcom.2018.10.113.

G. Nemeth, K. Horvath, Ch. Hervoches, P. Cejpek, J. Palan, M. Duchek, K. Mathis. *Characterization of the Microstructure, Local Macro-Texture and Residual Stress Field of Commercially Pure Titanium Grade Prepared by CONFORM ECAP*. Metals, 8(12):1000, 2018, doi: 10.3390/met8121000.

K. K. Tikuisis, L. Beran, P. Cejpek, K. Uhlirova, J. Hamrle, M. Vanatka, M. Urbanek, M. Veis. *Optical and magneto-optical properties of Permalloy thin films in 0.7-6.4 eV photon energy range*. Materials & Design, 114:31 – 39, 2017, doi: 10.1016/j.matdes.2016.10.036.

D. Kriegner, J. Furthmuller, R. Kirchschrager, J. Endres, L. Horak, P. Cejpek, H. Reichlova, X. Marti, D. Primetzhofer, A. Ney, G. Bauer, F. Bechstedt, V. Holy, G. Springholz. *Ferroelectric phase transitions in multiferroic $Ge_{1-x}Mn_xTe$ driven by local lattice distortions*. Physical Review B, 94(5):054112, 2016, doi: 10.1103/PhysRevB.94.054112.

O. Heczko, P. Cejpek, J. Drahokoupil, V. Holy. *Structure and microstructure of Ni-Mn-Ga single crystal exhibiting magnetic shape memory effect analysed by high resolution X-ray diffraction*. Acta Materialia, 115:250 – 258, 2016, doi: 10.1016/j.actamat.2016.05.047.

L. Beran, P. Cejpek, M. Kulda, R. Antos, V. Holy, M. Veis, L. Straka, O. Heczko. *Optical and magneto-optical studies of martensitic transformation in Ni-Mn-Ga magnetic shape memory alloys*. Journal of Applied Physics, 117(17):17A919, 2015, doi: 10.1063/1.4917059.

Presentations of the results at the international conferences:

30/08/2024-02/09/2024, 18th European Powder Diffraction Conference (EPDIC), Padova, Italy – poster

18/03/2024-21/03/2024, 32nd Annual Meeting of the German Crystallographic Society (DGK), Bayreuth, Germany – poster

29/03/2023-30/03/2023, 23rd Werkstofftechnisches Kolloquium (WTK), Chemnitz, Germany – oral contribution

29/05/2022-03/06/2022, 17th European Powder Diffraction Conference (EPDIC), Šibenik, Croatia – poster

14/08/2021-22/08/2021, 25th Congress of the International Union of Crystallography (IUCr), Prague, Czech Republic – poster

04/11/2019-08/11/2019, 63rd Annual Conference on Magnetism and Magnetic Materials (MMM), Las Vegas, USA – *poster*

18/08/2019-23/08/2019, 32nd European Crystallographic Meeting (ECM), Vienna, Austria – *poster*

22/08/2018-27/08/2018, 31st European Crystallographic Meeting (ECM), Oviedo, Spain – *poster*

06/11/2017-10/11/2017, 62nd Annual Conference on Magnetism and Magnetic Materials (MMM), Pittsburgh, USA – *poster*

04/09/2016-08/09/2016, 13th Biennial Conference on High-Resolution X-Ray Diffraction and Imaging (XTOP), Brno, Czech Republic – *poster*

23/08/2015-28/08/2015, 29th European Crystallographic Meeting (ECM), Rovinj, Croatia – *poster*

05/07/2015-10/07/2015, 20th International Conference on Magnetism (ICM), Barcelona, Spain – *poster*

03/11/2014-07/11/2014, 59th Annual Conference on Magnetism and Magnetic Materials (MMM), Honolulu, USA – *poster*

25/09/2013-28/09/2013, 9th Autumn School on X-ray Scattering from Surfaces and Thin Layers, Smolenice, Slovakia – *oral contribution*

Regular participation on Kolokvium Struktura of Czech and Slovak Crystallographic Association, 2013-2025 – *oral contributions*

Courses, study visits and stays abroad

24/03/2025-26/03/2025 – participation on the synchrotron experiment at PETRA III facility (DESY, Germany), Obstruction of the crystallization kinetics in Mg-based metallic glasses

24/07/2023-28/07/2023 – course for DISCUS, the program for the simulation of a diffuse scattering and a pair distribution function (Erlangen, Germany)

02/11/2022-06/11/2022 – participation on the synchrotron experiment at PETRA III facility (DESY, Germany), Reciprocal space mapping by X-ray diffraction on GaN epitaxial layers

30/10/2018-05/11/2018 – participation on the synchrotron experiment at SPring-8 facility (SPring-8, Japan), Inelastic X-ray Scattering of LaPd₂Al₂ single-crystal

13/05/2018-19/05/2018 – participation on the synchrotron experiment at SPring-8 facility (SPring-8, Japan), Inelastic X-ray Scattering of CePd₂Al₂ single-crystal

27/02/2017-30/03/2017 – participation on the monthly course HERCULES, European School (Grenoble, France)

December 2016 – participation on the synchrotron experiment at SOLEIL facility (Paris, France), Diffuse X-ray scattering from Pb_{1-x}Sn_x(Se,Te) epitaxial layers

23/11/2016-25/11/2016 – course for JANA, the program for the crystallographic data analysis (Prague, Czech Republic)

July 2016 – participation on the synchrotron experiment at DIAMOND facility (Didcot, United Kingdom), EXAFS on Ge_{1-x}Mn_xTe epitaxial films

June 2016 – participation on the synchrotron experiment at ESRF facility (Grenoble, France), Determination of the crystallographic ordering of Co_{2-x}Fe_{1+x}Si Heusler film by anomalous diffraction

08/02/2016 – EXAFS course, ESRF User meeting 2016 (Grenoble, France)

June 2014 – participation on the synchrotron experiment at ANKA facility (Karlsruhe, Germany),
EXAFS on $\text{Ge}_{1-x}\text{Mn}_x\text{Te}$ epitaxial films