Author's CV

Dr. Peter Kúš, Ph.D. (10. 10. 1989, Banská Bystrica, Slovakia)
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Education

2013–2018 Charles University, Faculty of Mathematics and Physics
- *Ph.D. candidate* (*Physics of Surfaces and Interfaces*)

2011–2013 Charles University, Faculty of Mathematics and Physics
- *Master's degree* (*Physics of Surfaces and Ionized Media*)

2008–2011 Charles University, Faculty of Mathematics and Physics
- *Bachelor's degree* (*General Physics*)

Experience

2010–present Member of a research group at the Department of Surface and Plasma Science (Faculty of Mathematics and Physics—Charles University)

P. Kúš, *Thin-Film Catalysts for Proton Exchange Membrane Water Electrolyzers and Unitized Regenerative Fuel Cells*, Springer Theses,
https://doi.org/10.1007/978-3-030-20859-2

- *Scientific work in the field of proton exchange membrane fuel cells and electrolyzers*
- *Focusing on development of nanostructured thin-film catalysts, utilizing complex multi target magnetron sputtering*
- *Experience in advanced morphology characterization by scanning electron microscopy and atomic force microscopy*
- *Experience in electrochemical cell testing*

2016 (5 months) Fellowship at National Institute for Materials Science (Tsukuba, Japan)

- *Focusing on development of fuel cell cathode with low-loading of platinum*

2013 (1 month) Cofely (GDF Suez)—Finance and Support Division intern

2012 (2 months) Intern at the Department of Experimental Physics (Faculty of Mathematics, Physics and Informatics—Comenius University in Bratislava)

- *Focusing on preparation of thin films using DC magnetron sputtering*

2012 (1 month) TopSoft BSB Ltd.—intern at the Department of Network Development

Research Grants

2018–present TAČR #TG01010108
Development of thin-film catalyst with low noble metal content for unitized regenerative fuel cells (Principal Investigator)

2017–present GAČR #18-06989Y
Novel materials for proton exchange membrane water electrolyzers (Co-Investigator)

2017–2018 GAUK #1016217
Reversible hydrogen fuel cells based on thin-film nanostructured catalysts with minimum noble metal loading (Principal Investigator)

2016–2018 GAUK #897316
Influence of fluorine doping on oxygen storage capacity of Rh/CeOxFy catalysts (Co-Investigator)

2014–2017 GAUK #236214
Nanostructured gas sensors based on tin and cerium oxides, doped by noble metals (Principal Investigator)

Attended Workshops

2012 (1 week)	Kvant Ltd. workshop—Scanning electron microscopy, EDX, WDX (Tescan systems, Comenius University in Bratislava)
2011 (1 week)	Kvant Ltd. workshop—Atomic force microscopy (NT-MDT systems, Comenius University in Bratislava)
2006 (1 week)	Modern microscopy workshop, digital imaging and correct laboratory practice (Comenius University in Bratislava)

Language Skills

	Slovak (native language)
	Czech (fluent)
	English (fluent)
	German (intermediate)
2008	German Graduation (Level B)
2008	English Graduation (Level A)
2007	Certificate of Advanced English (ESOL)
2005	First Certificate in English (ESOL)
2004 (3 weeks)	Mountlands Language School (UK)
2003 (2 weeks)	English Language Course (ESE-Malta)

Additional Information

Computer literacy	MS Office, Origin
Specialized software literacy	KolXPD, Gwyddion, Inventor, EC-Lab
Experienced with methods/techniques	SEM, EDX, AFM, XPS, magnetron sputtering, electrochemical cell testing
Number of scientific publications	19 (April 2019)
Number of citations	88, h-index 5 (April 2019)
Talks at international conferences	6 (April 2019)
Posters at international conferences	8 (April 2019)
Supervised student projects	4 (April 2019)
Driving license (B)	

Interests

Traveling, Skiing, Sci-fi and Fantasy

List of Scientific Publications (April 2019)

Ostroverkh, A; Johánek, V; Dubau, M; Kúš, P; Khalakhan, I; Šmíd, B; Fiala, R; Václavů, M; Ostroverkh, Y; Matolín, V: Optimization of ionomer-free ultra-low loading Pt catalyst for anode/cathode of PEMFC via magnetron sputtering, Int. J. Hydrogen Energy, 2019. https://doi.org/10.1016/j.ijhydene.2018.12.206

Kot, M; Henkel, K; Naumann, F; Gargouri, H; Lupina, L; Wilker, V; Kus, P; Pozarowska, E; Garain, S; Rouissi, Z; Schmeißer, D: Comparison of plasma-enhanced atomic layer deposition AlN films prepared with different plasma sources, Journal of Vacuum Science & Technology A, 37 (2): Art. No. 020913 (11 pages), 2019. https://doi.org/10.1116/1.5079628

Kot, M; Kegelmann, L; Das, C; Kus, P; Tsud, N; Matolinova, I; Albrecht, S; Matolin, V; Schmeisser, D: Room-Temperature Atomic-Layer-Deposited Al2O3 Improves the Efficiency of Perovskite Solar Cells over Time, ChemSusChem, 11 (20): 3640–3648, 2018. https://doi.org/10.1002/cssc.201801434

Khalakhan, I; Choukourov, A; Vorokhta, M; Kúš, P; Matolínová, I; Matolín, V: In situ electrochemical AFM monitoring of the potential-dependent deterioration of platinum catalyst during potentiodynamic cycling, Ultramicroscopy, 187 (Apr): 64–70, 2018. https://doi.org/10.1016/j.ultramic.2018.01.015

Khalakhan, I; Waidhas, F; Brummel, O; Vorokhta, M; Kúš, P; Yakovlev, YV; Bertram, M; Dopita, M; Matolínová, I; Libuda, J; Matolín, V: Nanoscale Morphological and Structural Transformations of PtCu Alloy Electrocatalysts during Potentiodynamic Cycling, J. Phys. Chem. C, 122 (38): 21974–21982, 2018. https://doi.org/10.1021/acs.jpcc.8b06840

Gauter, S; Haase, F; Solař, P; Kylián, O; Kúš, P; Choukourov, A; Biederman, H; Kersten, H: Calorimetric investigations in a gas aggregation source, J. Appl. Phys., 124 (7): Art. No. 073301 (10 pages), 2018. https://doi.org/10.1063/1.5037413

Rednyk, A; Mori, T; Yamamoto, S; Suzuki, A; Yamamoto, Y; Tanji, T; Isaka, N; Kúš, P; Ito, S; Ye, F: Design of Active Sites on Nickel in the Anode of Intermediate-Temperature Solid Oxide Fuel Cells using Trace Amount of Platinum Oxides, ChemPlusChem, 83 (8): 756–768, 2018. https://doi.org/10.1002/cplu.201800170

Haviar, S; Chlupová, Š; Kúš, P; Gillet, M; Matolín, V; Matolínová, I: Micro-contacted self-assembled tungsten oxide nanorods for hydrogen gas sensing, Int. J. Hydrog. Energy, 42 (2): 1344–1352, 2017. https://doi.org/10.1016/j.ijhydene.2016.09.187

Khalakhan, I; Vorokhta, M; Kúš, P; Dopita, M; Václavů, M; Fiala, R; Tsud, N; Skála, T; Matolín, V: In situ probing of magnetron sputtered Pt-Ni alloy fuel cell catalysts during accelerated durability test using EC-AFM, Electrochim. Acta, 245 (10 Aug): 760–769, 2017. https://doi.org/10.1016/j.electacta.2017.05.202

Monai, M; Montini, T; Melchionna, M; Duchoň, T; Kúš, P; Chen, C; Tsud, N; Nasi, L; Prince, KC; Veltruská, K; Matolín, V; Khader, MM; Gorte, RJ; Fornasiero, P: The effect of sulfur dioxide on the activity of hierarchical Pd-based catalysts in methane combustion, Appl. Catal. B-Environ., 202 (Mar): 72–83, 2017. https://doi.org/10.1016/j.apcatb.2016.09.016

Khalakhan, I; Lavková, J; Matolínová, I; Vorokhta, M; Potin, V; Kúš, P; Václavů, M; Maraloiu, V-A; Kuncser, A-C; Matolín, V: Electrochemically shape-controlled transformation of magnetron sputtered platinum films into platinum nanostructures enclosed by high-index facets, Surf. Coat. Technol., 309 (15 Jan): 6–11, 2017. https://doi.org/10.1016/j.surfcoat.2016.11.017

Ostroverkh, A; Dubau, M; Johanek, V; Kus, P; Khalkhan, I; Vaclavu, M; Fiala, R; Ostroverkh, Y; Matolin, V: Optimization of Pt Catalyst for Anode/Cathode of PEMFC via Magnetron Sputtering, ECS Trans., 80 (8): 839–845, 2017. https://doi.org/10.1149/08008.0839ecst

Ostroverkh, A; Johanek, V; Dubau, M; Kus, P; Veltruska, K; Vaclavu, M; Fiala, R; Smid, B; Ostroverkh, Y; Matolin, V: Novel Fuel Cell MEA Based on Pt-C Deposited by Magnetron Sputtering, ECS Trans., 80 (8): 225–230, 2017. https://doi.org/10.1149/08008.0225ecst

Kúš, P; Ostroverkh, A; Ševčíková, K; Khalakhan, I; Fiala, R; Skála, T; Tsud, N; Matolin, V: Magnetron sputtered Ir thin film on TiC-based support sublayer as low-loading anode catalyst for proton exchange membrane water electrolysis, Int. J. Hydrog. Energy, 41 (34): 15124–15132, 2016. https://doi.org/10.1016/j.ijhydene.2016.06.248

Ostroverkh, A; Johánek, V; Kúš, P; Šedivá, R; Matolín, V: Efficient Ceria–Platinum Inverse Catalyst for Partial Oxidation of Methanol, Langmuir, 32 (25): 6297–6309, 2016. https://doi.org/10.1021/acs.langmuir.6b01316

Khalakhan, I; Fiala, R; Lavková, J; Kúš, P; Ostroverkh, A; Václavů, M; Vorokhta, M; Matolínová, I; Matolín, V: Candle Soot as Efficient Support for Proton Exchange Membrane Fuel Cell Catalyst, Fuel Cells, 16 (5): 652–655, 2016. https://doi.org/10.1002/fuce.201600016

Kettner, M; Ševčíková, K; Duchoň, T; Kúš, P; Rafaj, Z; Nehasil, V: Morphology and CO Oxidation Reactions on Anion Doped CeOXFY/Rh(111) and CeOX/Rh(111) Inverse Catalysts, J. Phys. Chem. C, 120 (47): 26782–26792, 2016. https://doi.org/10.1021/acs.jpcc.6b07431

Monai, M; Montini, T; Melchionna, M; Duchoň, T; Kúš, P; Tsud, N; Prince, KC; Matolin, V; Gorte, RJ; Fornasiero, P: Phosphorus poisoning during wet oxidation of methane over Pd@CeO2/graphite model catalysts, Appl. Catal. B-Environ., 197 (15 Nov): 271–279, 2016. https://doi.org/10.1016/j.apcatb.2015.10.001

Vorokhta, M; Khalakhan, I; Vaclavu, M; Kovacs, G; Kozlov, SM; Kus, P; Skala, T; Tsud, N; Lavkova, J; Potin, V; Matolinova, I; Neyman, KM; Matolin, V: Surface composition of magnetron sputtered Pt-Co thin film catalyst for proton exchange membrane fuel cells, Appl. Surf. Sci., 365 (Mar): 245–251, 2016. https://doi.org/10.1016/j.apsusc.2016.01.004