# doc. Ing. Alexander Kromka, DrSc.

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https://www.fzu.cz/~kromka/


## *Current occupation*

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| since 11/2022 | Deputy head of the Department of Semiconductors, group leader of the Diamond growth, Institute of Physics CAS, Prague, Czech Republic. |

## *Education and research stays*

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| 2019 | visiting research scientist at the Technical University Wien, group of Prof. Ulrich Schmid (ISAS TU Wien, Austria). Theme: *MEMS devices based on diamond and AlN thin films* (6 months). |
| 2017 | Habilitation in the field of Applied Physics at the Faculty of Electrical Engineering, Czech Technical University in Prague., doc. degree (assoc. prof. equivalent). Theme: *Advanced diamond-based (bio) sensors.* |
| 2016 | DrSc. degree, Slovak Academy of Sciences, 020205 – Electrotechnology and materials, Bratislava, Slovakia, Thesis: *Novel trends in diamond thin film technologies for fundamental and applied research.* |
| 2008 | visiting research scientist at the Institute for Materials Research, group of Prof. Dr. Ken Haenen (IMO IMEC, Hasselt-Belgium). Theme: *Growth of boron doped diamond by MW plasma CVD* (3 months). |
| 2003 - 2005 | researcher at rho-best coating plc., a group Dr. Doris Steinmuller-Nethl (Innsbruck, Austria), Theme: *Large area growth of nano-crystalline diamond by modified HF CVD process.* |
| 2001 - 2002 | post-doctoral position at the Institute of Electron Devices and Circuits, group Prof. Dr. Erhard Kohn (EBS, Ulm – Germany), Theme: *3-Dimensional multi-chip modules (supported by Infineon).* |
| 2001 | Ph.D. degree, Department of Microelectronics, Faculty of Electrical Engineering and Information Technology, Slovak Technical University, Ilkovičova 3, 812 19 Bratislava, Slovak Republic, Ph.D. Thesis: *Growth of Diamond Thin Films by a Hybrid Hot Filament CVD Technique* |
| 1989 - 1999 | technician at the Department of Physics, CUHK Hong Kong, group Prof. Leo W.M. Lau (CUHK, Honk Kong), Theme: *Design and development of vacuum chamber for advanced ion beam and laser technologies, vacuum and thin film technology.* |
| 1995 | Ing degree (MSEE equivalent), Department of Microelectronics, Faculty of Electrical Engineering and Information Technology, Slovak Technical University, Ilkovičova 3, 812 19 Bratislava, Slovak Republic, MSEE Thesis: *Deposition and Properties of AlN and SiC Films* |
| 1995 | Extended economical study finished with state exam: *Management and Marketing* |

## *Research interests*

Diamond and CNT nanostructures, microwave plasma assisted CVD processes, material structuring by reactive ion etching, diamond-based electronic and optical devices, biosensors, seeding and nucleation techniques, polymer composites, surface modifications and functionalization, material characterization.

## *Teaching activities*

Nanotechnology (FSv CVUT in Prague, a program for Ph.D. students), Biosensors (FEL CVUT in Prague, supervised by Prof. B. Rezek), Selected chapters from nanoelectronics (FJFI CVUT in Prague, supervised by Prof. E. Hulicius), Chapters from nanoelectronics (TU Liberec, supervised by Prof. E. Hulicius), Progressive physical technologies (FApV, ZCU Plzen).

Member of the *branch council of the doctoral study*

P 2612 *Electronics* (2013-2017, 2017-2019, 2019-2024), Depart. of Microelectronics, CVUT in Prague
*Applied physics* (2019-2024), Depart. of Physics, CVUT in Prague

Ph.D. students:

finished: T. Ižák, M. Davydova, M. Varga, O. Babchenko, M. Domonkos
active: V. Procházka, J. Budil, M. Koči

Master students: T. Daniš, F. Balon, M. Domonkos, J. Mlčoch, R. Hlůžek, M. Koči

## *Publication activities*

Co-author of over 280+ scientific articles in international peer-reviewed journals that were cited more than 4000 times (h-index 30), 6 patents, 8 utility models (CZ) and 2 industrial procedures (CZ). Author or co-author of 8 book chapters. Author of 15 invited keynote and plenary lectures at International Conferences.

## *Editorial activities*

since 2020 Editorial board *Nanomaterials*
since 2018 Editorial board *Advances in Materials Science and Engineering*
2012-2017 Editorial board *Journal of Materials*

## *Membership in international conferences/workshops*

2020 *ASDAM '20* - 13th Int. Conf. on Advanc. Semicond. Devices And Microsystems, Smolenice, Slovakia
2009-2018 *SBDD* International Hasselt Diamond Workshop, Hasselt Belgium
2018 *Nanoscale Quantum Optics Conference* and MC Meeting, Prague, Czechia
2018 *CIMTEC* - 14th Inter. Conf. on Modern Materials and Technologies, Perugia, Italy
2018 *IWMSE* 4th Annual International Workshop on Materials Science and Engineering, Xi'an, China
2017 *E-MRS Spring*, NANOMATERIALS: section Q, Strasbourg, France
2011 *DINAS II*: Diamond Nanotechnology and Science, Prague, Czech Republic
2009 *DINAS I*: Diamond Nanotechnology and Science, Prague, Czech Republic

## *Other activities*

Member of the Slovak and Czech Vacuum Society (SVS & CVS)
Member of the Czechoslovak Association for Crystal Growth (CSACG)
Member of the COST action MP1403 – Nanoscale Quantum Optics
Referee to >10 scientific journals (Nanomaterials, DRM, Surf Coat Tech, Carbon, pss a, ACS journals, …)

## *Previous and running projects (applicant & co-applicant)*

**Bilateral CZ-India** (MŠMT, 01/2021 – 12/2022) Nano-structured Conductive Boron Doped Diamond Electrodes for Electrochemical Studies (Czech Academy of Sciences, Mobility Plus)

**8X20035** (bilateral Danube region MŠMT) (03/2020-12/2022) Advanced Microcantilevers from Wide Bandgap Materials (Bilateral CZ-SK-AT)

**TK02020094** (TAČR) (07/2019 - 06/2023) 3D printed diamond composite components for more efficient energetics

**15-33018A** (AZV) (05/2015-12/2018) Application of adipose tissue-derived stem cells obtained by liposuction in tissue engineering

**P108/12/G108** (GAČR) (01/2012 - 12/2018) Preparation, modification and characterization of materials by radiation

**15-01687S** GAČR (01/2015 - 12/2017) - Allotropes of carbon: microbiological studies

**P108/12/0910** GAČR (01/2012 - 12/2014) - Fabrication, structuring and treatment of nanocrystalline diamonds for antibacterial studies FaST-DiAS

**SAV SK&AV CR** (bilateral project, GAAV) (01/2012 - 12/2014) Advanced M(N)EMS devices based on GaN-Diamond material system

**TA01011740** (01/2011-12/2014) Hybrid high-density low-temperature microwave plasma sources in matrix configuration suitable for growth of advanced materials and their (nano) composites on 2D and 3D substrates

**FR-TI2/736** (MPO) (2010-5/2014) Modular Scanning Electron Microscope

Purkyně Fellowship (01/2009-12/2013) Growth of diamond and carbon nanostructures (AVCR)

**M100100905** (bilateral, GAAV) (06/2009-05/2012) Study of interaction of (bio) molecules with synthetic diamond surfaces with Uppsala University

**MEB0810082** (bilateral Kontakt MŠMT) (01/2010-12/2011) Directed manipulation of surfaces of carbon allotropes and their characterization with ILC Bratislava

**P108/11/0794** (GAČR) (01/2011-12/2013) Visualization of collagen production in osteogenic cells cultivated on nanocrystalline diamond films