

**Ing. Karel Saksal, DrSc.**

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**Current position(s):**

Deputy Director for Science

Leading scientist

Head of the Division of metallic systems

**Profile:**

Ing. Karel Saksal, DrSc. is world recognized scientist in material science and condensed matter physics with focused mainly on characterization of highly disordered materials. Is an expert on X-ray diffraction, X-ray absorption spectroscopy and mathematical modelling of disordered structures. He is author of 76 international current contents publications (116 WOS, 120 SCOPUS) from which 47 are devoted to research on amorphous materials. His works are highly cited, 1375 SCI, and current h-index of K. Saksal is 20. As the member of international research team contributed to breakthrough discovery of saturated absorption on aluminum, published in journal NATURE PHYSICS in 2009. As a scientific secretary of the XFEL commission nominated by ministry of education of SR is helping in accession of the Slovak republic to international project the European XFEL (most powerful source of X-ray radiation on the world, build in Hamburg) and its implementation to Slovak scientific community. Is official Slovak representative in the user consortia "Serial femtosecond X-ray crystallography" and the "Integrated Biology Infrastructure Life-Science Facility at the European XFEL". Is also member and scientific secretary in commission for coordination of activities in the ESFRI projects. Currently is supervising four PhD. students.

**Experience:**

1997 - current Institute of Materials Research, Slovak Academy of Sciences

2002 -2007 post-doctorate DESY Hamburg, Germany

2001 post-doctorate Department of Physics, DTU, Denmark

2000 study stay, MIC DTU, Denmark

**Organisation of Scientific Meetings:**

2010 – official representative of the Slovak republic in Council of the European XFEL

2014 – official representative of the Slovak in user consortia Serial Femtosecond Crystallography a the XFEL Biology Infrastructure.

2009 – 2013 member of the Scientific Advisory Committee of the European XFEL.

2006 – member and scientific secretary of the ESFRI Commission

2012 – 2016 member of domestic scientific grant agency VEGA

**Projects:**

(najviac 5 najvýznamnejších projektov, ktoré pracovník viedol, resp. spolupracoval na ich vedení):

1. Macro, Micro and Nano Aspects of Machining, 7.RP EU PITN-GA-2008-211536, 2008-2012.

2. Novel explosive welded corrosion resistant clad materials for geothermal plants, M-Era.Net, 2014-2017

3. Development and research of metallic glasses and nanocrystalline materials, VEGA 2/0021/16, 2016-2018

4. Development of new biodegradable alloys for medical and prophetic applications, APVV-17-0008, 2018-2020

5. Development of device for effective compression and storage of hydrogen in metalhydride alloys, APVV-15-0202, 2016-2019

**Five representative publications:**

1. **SAKSL, K.**, ROKICKI, P., SIEMERS, C., OSTROUSHKO, D., BEDNARČÍK, J., RÜTT, U.: Local structure of metallic chips examined by X-ray microdiffraction, (2013) Journal of Alloys and Compounds, 581, pp. 579-584
2. **SAKSL, K.**, ĎURIŠIN, J., BALGA, D., MILKOVIČ, O., BRESTOVIČ, T., JASMINSKÁ, N., ĎURIŠIN, M., GIRMAN, V., BALKO, J., KATUNA, Y., ŠULIKOVÁ, M., ŠULOVÁ, K., FEJERČÁK, M., BOLDI, J., BERTRAM, F. Devitrification and hydrogen storage capacity of the eutectic Ca<sub>72</sub>Mg<sub>28</sub> metallic glass (2017) Journal of Alloys and Compounds, 725, pp. 916-922.
3. KABAN, I., JÓVÁRI, P., KOKOTIN, V., SHULESHOVA, O., BEUNEU, B., **SAKSL, K.**, MATTERN, N., ECKERT, J., GREER, A.L.: Local atomic arrangements and their topology in Ni-Zr and Cu-Zr glassy and crystalline alloys, (2013) Acta Materialia, 61 (7), pp. 2509-2520
4. YANG, L. - GUO, G. - CHEN, L. - HUANG, C. - GE, T. - CHEN, D. - LIAW, P. - **SAKSL, K.** - REN, Y. - ZENG, Q. - LAQUA, B. - CHEN, F. - JIANG, J.: Atomic-scale mechanisms of the glass-forming ability in metallic glasses. Physical Review Letters, 109, 2012, s.105502
5. NAGLER, B. - **SAKSL, K.**: Turning solid aluminium transparent by intense soft X-ray photoionization. Nature Physics, 5, 2009, pp.693-696

**Patents:**

1. Ďurišin, J. - Orolínová, M. - Ďurišinová, K. - **Saksl, K.**: Preparation of nanocrystalline powder mixtures by dynamical reduction method. Patent No. 285928, Banská Bystrica, ÚPV SR 2007.

**Fellowships / Awards / Memberships of Scientific Societies:**

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| 2010 | Award of the Scientist of the Year of the SR 2009 for a breakthrough knowledge of "saturated aluminum absorption" using a record intensity of soft X-ray. radiation  |
| 2009 | Award of the Scientist of the Year of the SR SR 2008 for scientific work "How Metallic Fe Controls the Composition of its Native Oxide", published in the "PHYSICAL REVIEW LETTERS".   |
| 2008 | Award the scientist of the year 2007 for the scientific work "Atomic structure of glassy Mg <sub>60</sub> Cu <sub>30</sub> Y <sub>10</sub> investigated with EXAFS, X-ray and neutron diffraction, and reverse Monte Carlo simulations," published in one of the world's most prestigious journals on physics of solids "PHYSICAL REVIEW B". |