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Employment and positions

Institute of Metallurgy and Materials Science, Polish Academy of Sciences: Professor of Pol. Acad. Sci.

Scientific Career

M.Sc.: Jagiellonian University, Faculty of Physics, Astronomy and Applied Computer Science, 1990

Ph.D.: Institute of Metallurgy and Materials Science, Polish Academy of Sciences, 2002

D.SC.: Institute of Metallurgy and Materials Science, Polish Academy of Sciences, 2019

Scientific achievements

89 papers in refereed journals and periodicals, **110** presentations during conferences.

The most relevant publications during last 5 years

1.

N. Levintant-Zayonts, L. Kwiatkowski, **Z. Swiatek** and J. Brzozowska, Local Pseudoelastic Behaviour and Surface Characteristics of N Ion Implanted NiTi Shape Memory Alloy, *Acta Physica Polonica A*, Vol. 132, 2017, 210-216.

2.

Z. Świątek, H. Kazimierczak, P. Ozga, O. Bonchuk, and H. Savytskyy, Structural and Microstructural Analysis of Zn-Mo Alloy Layers Electrodeposited from Aqueous Citrate Solution, *Metallofiz. Noveishie Tekhnol.*, 39, No. 11: 1547-1556, 2017, DOI: 10.15407/mfint.39.11.1547.

3.

Zbigniew Swiatek, Igor Fodchukb and Ruslan Zaplitnyy, X-ray topography of subsurface crystal layers, *Journal of Applied Crystallography*, 2017, 50, 727-733, <https://doi.org/10.1107/S1600576717007208>.

4.

Honorata Kazimierczak, Jerzy Morgiel, Zbigniew Swiatek, Jesús Manuel Vega, Eva García-Lecina, Effect of Mo addition on corrosion of Zn coatings electrodeposited on steel, *Corrosion Science*, 2018, <https://doi.org/10.1016/j.corsci.2018.02.039>.

5.

I. I. Izhnin, E. I. Fitsych, A. V. Voitsekhovskii, A. G. Korotaev, K. D. Mynbaev, V. S. Varavin, S. A. Dvoretzky, N. N. Mikhailov, M. V. Yakushev, A. Yu. Bonchuk, H. V. Savitsky, and **Z. Świątek**

, Defects in arsenic implanted p+-n- and n+-p- structures based on MBE grown CdHgTe films, Russian Physics Journal, Vol. 60, No. 10, 2018, 1752-1757.

6.

H. Kazimierzak, K. Szymkiewicz, P. Bobrowski, **Z. Świątek**, Ł. Rogal, E. Gileadi, and N. Eliaz, The Effect of SiC Nanoparticle Size on the Electrodeposition of Zn-SiC Nanocomposite Coatings from Citrate Bath, Journal of The Electrochemical Society 165 (14), 2018, D774-D782.

7.

Zbigniew Świątek, Dyfraktometria mikrodefektów w kryształach, 2017, Instytut Metalurgii i Inżynierii Materiałowej, Polska Akademia Nauk, ISBN 978-83-60768-35-8, 128.

8.

O. Yu. Bonchuk, H. V. Savitsky, **Z. Swiatek**, J. Morgiel, I. I. Izhnin, A. V. Voitsekhovskii, A. G. Korotaev, K. D. Mynbaev, O. I. Fitsych, V. S. Varavin, S. A. Dvoretzky, D. V. Marin, M. V. Yakushev, Nano-size defects in arsenic-implanted HgCdTe films: a HRTEM study, Applied Nanoscience, 2018, <https://doi.org/10.1007/s13204-018-0679-y>, 1 - 6.

9.

I. M. Fodchuk, R. A. Zaplitnyy, Yu. T. Roman, V. B. Molodkin, T. P. Vladimirova, and **Z. Świątek**, Applied Capabilities of X-Ray Topography of Crystals in the Skew-Asymmetric Bragg Diffraction, Metallofizika i Noveishie Tekhnologii 40(5), 2018, 561-583.

10.

A. Hara, H. Kazimierzak, A. Bigos, **Z. Świątek**, P. Ozga, Effect of different organic additives on surface morphology and microstructure of Zn-Mo coatings electrodeposited from citrate baths, Arch. Metall. Mater. 64(1), 2019, 207-220.

11.

I.I. Izhnina, O.I. Fitsych, **Z.Swiatek**, J. Morgiel, O.Yu. Bonchuk, H.V. Savitsky,K.D.

Mynbaev, A.V. Voitsekhovskii, A.G. Korotaev, M.V. Yakushev, D.V. Marin, V.S. Varavin, S.A. Dvoretzky, review, Effect of annealing on the structural properties of arsenic-implanted mercury cadmium telluride, Opto-Electronics Review 27, 2019, 14-17.

12.

I.I. Izhnin, K.D. Mynbaev, A.V. Voitsekhovsky, A.G. Korotaev, I.I. Syvorotka, O.I. Fitsych, V.S. Varavin, S.A. Dvoretzky, N.N. Mikhailov, V.G. Remesnik, M.V. Yakushev, **Z. Swiatek**, J. Morgiel, O.Yu. Bonchuk, and H.V. Savytskyy, Arsenic-ion implantation-induced defects in HgCdTe films studied with Hall-effect measurements and mobility spectrum analysis, Infrared Physics and Technology 98, 2019, 230-235.

13.

M.D. Borchala, M.S. Solodkyi, S.V. Balovsyak, V.M. Tkach, I.I. Hutsuliak, A.R. Kuzmin, O.O. Tkach, V.P. Kladko, O.Yu. Gudymenko, O.I. Liubchenko, **Z. Świątek**, Features of structural changes in mosaic Ge:Sb according to X-ray diffractometry and electron backscatter diffraction data, Semiconductor Physics, Quantum Electronics & Optoelectronics, 2019, 22(4), 381-386, <https://doi.org/10.15407/spqeo22.04.381>.

14.

I. Izhnin, O. I. Fitsych, A. V. Voitsekhovskii, A. G. Korotaev, V. S. Varavin, S. A. Dvoretzky, N. N. Mikhailov, V. G. Remesnik, M. V. Yakushev, O.Yu. Bonchuk, H.V. Savytskyy, **Z. Swiatek**, J. Morgiel, Lokalizacja i proroada radiacyjnych defektów w implantowanych muszjakom plenkach CdHgTe, wyraszczonych MLE, Izvestia Wysszych Uczebnych Zawiedzenii, Fizyka, 63 (2), 2020, 98-103.

15.

Nikolay Mikhailov, Vasiliy Shvets, Danil Ikusov, Ivan Uzhakov, Sergey Dvoretzky, Karim Mynbaev, Piotr Dłuzewski, Jerzy Morgiel, **Zbigniew Swiatek**, Olexander Bonchuk, and Ihor Izhnin, Interface Studies in HgTe/HgCdTe Quantum Wells, Phys. Status Solidi B 2020, 1900598, DOI: 10.1002/pssb.201900598.

16.

Yu. Bonchuk, H. V. Savytskyy, I. I. Izhnin, K. D. Mynbaev, I. I. Syvorotka, A. G. Korotaev, A. V. Voitsekhovskii, O. I. Fitsych, V. S. Varavin, D. V. Marin, N. N. Mikhailov, M. V. Yakushev, **Z. Swiatek**, J. Morgiel, R. Jakiela, Nano-size defect layers in arsenic-implanted and annealed HgCdTe

epitaxial films studied with transmission electron microscopy, *Applied Nanoscience*, 2020, DOI 10.1007/s13204-020-01327-9.

17.

Ihor Izhnin, Karim Mynbaev, **Zbigniew Swiatek**, Jerzy Morgiel, Alexander Voitsekhovskii, Alexandr Korotaev, vasily varavin, Sergei Dvoretzky, Denis Marin, Maxim Yakushev, Olena Fitsych, Olexander Bonchuk, Hryhoryy Savytskyy, Direct comparison of the results of arsenic ion implantation in n- and p-type Hg_{0.8}Cd_{0.2}Te, *Infrared Physics and Technology*, 109, 2020, 103388, <https://doi.org/10.1016/j.infrared.2020.103388>.

18.

A.G. Korotaev, I.I. Izhnin, K.D. Mynbaev,?, A.V. Voitsekhovskii, S.N. Nesmelov, S.M. Dzyadukh, O.I. Fitsych, V.S. Varavin, S.A. Dvoretzky, N.N. Mikhailov, M.V. Yakushev, O.Yu. Bonchuk, H.V. Savytskyy, **Z. Swiatek**, J. Morgiel, Hall-effect studies of modification of HgCdTe surface properties with ion implantation and thermal annealing, *Surface & Coatings Technology* 393, 2020, 125721, <https://doi.org/10.1016/j.surfcoat.2020.125721>.

19.

I Izhnin¹, K D Mynbaev, A V Voitsekhovskii, S N Nesmelov², S M Dzyadukh, A G Korotaev, V S Varavin, S A Dvoretzky, D V Marin, M V Yakushev, **Z Swiatek**, J Morgiel and O Yu Bonchuk, Electrical and microscopic characterization of p+-type layers formed in HgCdTe by arsenic implantation, *Semicond. Sci. Technol.* 35, 2020, 115019 (9pp), <https://doi.org/10.1088/1361-6641/ab924e>.

20.

Honorata Kazimierzaka, **Zbigniew Świątek**, Piotr Ozga, Electrodeposition of tin-zinc-bismuth alloys from aqueous citrate-EDTA baths, *Electrochimica Acta*, 2020, 338, 135889, <https://doi.org/10.1016/j.electacta.2020.135889>.

21.

Agnieszka Hara, **Zbigniew Świątek**, Piotr Ozga, The role of surfactants in induced electrodeposition of Zn-Mo layer from citrate solutions, *Journal of Alloys and Compounds*, 2020, 827, 154195, <https://doi.org/10.1016/j.jallcom.2020.154195>.

22.

I.I.Izhnin, K.D.Mynbaev, A.V.Voitsekhovskii, A.G.Korotaev, V.S.Varavin, S.A.Dvoretzky, N.N.Mikhailov, M.V.Yakushev, O.I.Fitsych, **Z.Świątek**, R.Jakiela, Analysis of carrier species in arsenic-implanted p- and n-type Hg_{0.7}Cd_{0.3}Te, Infrared Physics & Technology, 2021, DOI: 10.1016/j.infrared.2021.103665.

23.

I. Izhnin, A. V. Voitsekhovskii, A. G. Korotaev, K. D. Mynbaev, **Z. Świątek**, J. Morgiel, O. I. Fitsych, V. S. Varavin, D. V. Marin, M. V. Yakushev, O. Yu. Bonchyk, H. V. Savytskyy, Nano scale structural studies of defects in arsenic implanted n- and p type HgCdTe films, Applied Nanoscience, 2021, <https://doi.org/10.1007/s13204-021-01704-y>.

Research Projects

Projects from Ministry of Science and Higher Education and POIG

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Development of photovoltaics to generate electricity under national conditions - development of high-efficiency monocrystalline silicon photovoltaic cells (PBZ project KBN 05 / T11 / 98 - topic 1A), IMMS PAS, main contractor, 2000-2002.

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Development of photovoltaics to generate electricity under national conditions - development of

high-efficiency monocrystalline silicon photovoltaic cells (PBZ project KBN 05 / T11 / 98 - topic 2), IMMS PAS, main contractor, 2000-2002.

-

Determination of technological rules for electrochemical deposition of Pb-free In-Sn solder alloys, project No 3T08A04527, IMMS PAS, contractor, 2004-2007.

-

Improvement of competition and innovation of national non-ferrous metal processing industry by study of advanced metallic materials and technology of its fabrication (Project: No PBZ-3/3): Task II-3.4: The Layers and the Protective Coatings on the Basis of Zinc Alloys with Ferrous Metals and Manganese for Replacing Cadmium Coatings Obtained by Electrodepositing from Complex Solutions, IMMS PAS, contractor, 2007-2010.

-

Elaboration of the passivation technology of crystallographic defects in polycrystalline silicon and silicon nano-particles creation by SiNx:H layers application to broaden spectral sensitivity of the photocells, project No. N N507 444234, IMMS PAS, contractor, 2008-2010.

-

Advance materials and their production technologies. ZAMAT. Project jointly financed by European Union and Poland, POIG.01.01.02-00-015/09-00, IMMS PAS, contractor, 2010-2015.

-

Research on the synthesis of intermetallic phases from multilayer coatings Al/Ni, Al/Ti and Ni/Ti using in-situ observation in TEM, NCN, contractor, 2014 - 2016.

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Investigation of properties and generation of thin layers on NiTi alloy with micro- and nanocrystalline structure by means of ion implantation (N2013/09/D/ST8/04011), grant finansowany Narodowym Centrum Nauki (NCN), contractor, 2014 - 2017.

International exchange programmes

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High-resolution X-ray diagnostics of structural defects, Yuri Fedkovych Chernivtsi National University, Department of Physics of Solid State, Chernivtsi, Ukraine, 2007-2009.

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X-ray structural diagnostic of corrosion processes in electrodeposited zinc-based alloys, Institute of Fundamental Problems of Mechanics and Mathematics, Lviv, Ukraine, 2012-2014.

-

Microstructure and physical/chemical properties of electrolytic Zn-Mo layers, Institute of Fundamental Problems of Mechanics and Mathematics, Lviv, Ukraine, 2015-2017.

-

Properties of HgCdTe heterostructures and their modification under ion implantation, Institute of Fundamental Problems of Mechanics and Mathematics, Lviv, Ukraine, 2018-2020.

Experience gained abroad:

Laboratorium PHASE CNRS, Strasbourg, 1996-2001 (2 months),

British Council School on Development of effective solar power generation, Southampton, 1997 (3 weeks).

WAXS and SAXS experiments carried out in the Synchrotron Laboratory ELETTRA in Trieste (Italy) in co-operation with the Vienna University, 1999 (1 week).

Universität Wien, Institut für Materialphysik. 1999 (1 week).

Yuri Fedkovych Chernivtsi National University, Department of Physics of Solid State, Chernivts, Ukraine 2007-2009 (3 weeks),

Institute of Fundamental Problems of Mechanics and Mathematics, Lviv, scientific cooperation, 2005-2013 (10 weeks).

Main scientific interest

X-ray structural diagnostic of multilayer materials and structural defects, protective coatings and metastable structures, diffusion processes in semiconducting epitaxial layers, photovoltaics – in frared detectors and silicon solar cells.

