

Phone.: +4812 2952868, Fax: +4812 2952804

e-mail: a.goral@imim.pl

Employment and positions

Institute of Metallurgy and Materials Science, Polish Academy of Sciences: assistant professor since 2007, head of the Laboratory of X-Ray Diffraction of Accredited Testing Labs since 2016, associate professor since 2019.

Scientific Career

M.Sc.: Cracow University of Technology, 2002

Ph.D.: Institute of Metallurgy and Materials Science, Polish Academy of Sciences, 2007

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

Postgraduate studies: Professional manager of research and development projects, University of Agriculture, 2012

Scientific achievements

98 papers, 51 of them cited by the Journal Citation Reports (JCR) , 4 chapters in monograph

The most relevant publications during last 5 years

1.

A. Góral, W. Żórawski, M. Makrenek, The effect of the standoff distance on the microstructure and mechanical properties of cold sprayed Cr₃C₂-25(Ni₂₀Cr) coatings, Surface and Coatings Technology 361 (2019) 9-18

2.

A. Góral, T. Czeppe, K. Berent, Oxidation behaviour of thin Ni/Al₂O₃ nanocomposite coatings electrodeposited on steel substrate, Surface and Coatings Technology 369 (2019) 95-104

3.

A. Góral, W. Żórawski, P. Czaja, L. Lityńska-Dobrzyńska, M. Makrenek, S. Kowalski, Effect of powder morphology on the microstructure and properties of cold sprayed Ni coatings, International Journal of Materials Research 110 (2019) 49-59

4.

A. Góral, W. Żórawski, Effect of powder grain size and titania content on mechanical and tribological properties of plasma sprayed Al₂O₃-TiO₂ ceramic coatings, Archives of Metallurgy and Materials 64 (2019) 45-53

5.

M. Scendo, W. Zorawski, **A. Goral**, Influence of nickel powders on corrosion resistance of cold sprayed coatings on Al7075 substrate, *Metals* 9(8), (2019) 890

6.

A. Góral, S. J. Skrzypek, The influence of alumina nanoparticles on lattice defects, crystallographic texture and residual stresses in electrodeposited Ni/Al₂O₃ composite coatings, *Applied Surface Science* 456 (2018) 147-155

7.

Anna Góral: Nanoscale structural defects in electrodeposited Ni/Al₂O₃ composite coatings, *Surface and Coatings Technology* 319 (2017) 23-32

8.

Anna Góral, Lidia Lityńska-Dobrzyńska, Marcin Kot: Effect of surface roughness and structure features on tribological properties of electrodeposited nanocrystalline Ni and Ni/Al₂O₃ coatings, *Journal of Materials Engineering and Performance* 26(5), (2017) 2118-2128

9.

Katarzyna Stan-Głowińska, Łukasz Rogal, **Anna Góral**, Anna Wierzbicka-Miernik, Joanna Wojewoda-Budka, Norbert Schell, Lidia Lityńska-Dobrzyńska, Formation of a quasicrystalline phase in Al-Mn base alloys cast at intermediate cooling rates, *Journal of Materials Science* 52 (2017) 7794-7807

10.

Wojciech Żorawski, Mieczysław Scendo, Janusz Mądry, Jarosław Sienicki, **Anna Góral**, Medard Makrenek, Szymon Kowalski, Właściwości powłok tytanowych natryskiwanym zimnym gazem. Rozdział w monografii: XX lat Centrum Laserowych Technologii Metali, 163-175, Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2017

11.

Lidia Lityńska-Dobrzyńska, Mikołaj Mitka, **Anna Góral**, Katarzyna Stan-Głowińska, Jan

Dutkiewicz: Microstructure and mechanical properties of aluminium matrix composites reinforced by Al₆₂Cu_{25.5}Fe_{12.5} melt spun ribbon, Materials Characterization 117 (2016) 127-133

12.

A. Dębski, S. Terlicka, W. Gąsior, **A. Góral**: Calorimetric study of the Li-Zn system Journal of Chemical Thermodynamics 103 (2016) 374-380

13.

Anna Góral, Katarzyna Berent, Marek Nowak, Bogusz Kania: Microstructure and properties of Ni and Ni/Al₂O₃ coatings electrodeposited at various current densities, Archives of Metallurgy and Materials 61 (2016) 55-60

14.

Anna Góral, Wojciech Żórawski: Charakterystyka mikrostruktury powłok Ni-Al₂O₃ natryskanych zimnym gazem, Przegląd Spawalnictwa 9 (2015) 34-37

15.

W. Żórawski, M. Makrenek, **A. Góral**: Mechanical properties and corrosion resistance of HVOF sprayed coatings using nanostructured carbide powders, Archives of Metallurgy and Materials 61 (2016) 1839-1846

16.

M. Mitka, **A. Goral**, L. Rogal, L. Litynska-Dobrzynska: Microstructure of mechanically alloyed and annealed Al₆₂Cu_{25.5}Fe_{12.5} powder, Journal of Alloys and Compounds 653 (2015) 47-53

17.

W. Żórawski, **A. Góral**, O. Bokuvka, L. Lityńska-Dobrzyńska, K. Berent: Microstructure and tribological properties of nanostructured and conventional plasma sprayed alumina-titania coatings Surface and Coatings Technology 268 (2015) 190-197

18.

W. Żórawski, **A. Góral**, B. Antoszewski, J. Świdorski, P. Furmańczyk: Kompozyty natryskane zimnym gazem w procesach elektrotechnologicznych. Procesy elektrotechnologiczne. Modelowanie i sterowanie. Rozdział w monografii M69, 226-239, Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2015

19.

A. Góral, M. Nowak, K. Berent, B. Kania: Influence of current density on microstructure and properties of electrodeposited nickel-alumina composite coatings, Journal of Alloys and Compounds 615 (2014) S406-S410

20.

A. Góral, L. Lityńska, W. Żórawski: Study of the microstructure of plasma sprayed coatings obtained from Al₂O₃-13TiO₂ nanostructured and conventional powders Materials Characterization 96 (2014), 234-240

21.

A. Kukula-Kurzyniec, J. Dutkiewicz **A. Góral**, C. Coddet, L. Dembiński, L. Perriere: Aluminium based composites strengthened with metallic amorphous phase or ceramic (Al₂O₃) particles Materials and Design 59 (2014) 246-251

Research Projects

Projects from Ministry of Science and Higher Education

-

Dependence of the microtexture on the directional crystallization rate of Al-CuAl₂ lamellar eutectic alloy, 2005-2007, main contractor

-

Elaboration of production technology of constructional elements of hot part of airplane engines by unidirectional solidification, PBZ-MNiSW-03/I/2007, IMMS PAS task: Advanced texture diagnostic in micro- and nano scale and measurements of residual stress in aspect of optimization of parameters of directional crystallization of superalloys, 2007-2011, contractor

-

Production of nano and ultramicrocrystalline super high-strength Al-Mg-Zn-Cu-Zr-Sc alloys and characteristic of their structure by high resolution transmission electron microscopy methods, 2008-2010, contractor

-

Thermodynamic investigations of Li-Si alloys as a material for safe hydrogen storage, 2010-2011, contractor

-

Thermodynamic of alloys for safe hydrogen storage and energy, 2012-2014, contractor

-

Thermodynamic studies of Ag-Li alloys as a material for safe storage of hydrogen, IMIM PAN, 2013-2015, contractor

Projects from National Science Centre

-

Characterization of structure and properties of Ni/Al₂O₃ composite coatings, NCN, 2011-2014, supervisor

-

Thermodynamic properties and phase diagrams of Be-B and Be-Li alloys as materials for safe hydrogen storage, NCN, 2011-2014, contractor

-

Massive amorphous aluminum alloys obtained by consolidation of powders after metallic synthesis, spraying from liquids or strips after rapid cooling, NCN, 2011-2013, contractor

-

Characterization of aluminium matrix composites reinforced by quasicrystalline particles, NCN, 2012-2015, contractor

-

The effect of alloying additives on the ability to form quasicrystals in Al-Mn based alloys, NCN, 2013-2016, contractor

-

The effect of selected alloy additives (Cr, Mn, Co, Si) on the formation and stabilization of the quasicrystalline phase in Al-Cu-Fe powder obtained by mechanical synthesis, NCN, 2016-2018, contractor

-

Thermodynamic characteristics of the Ga-Li system, NCN, 2015-2018, contractor

-

Thermodynamic properties and structure of alloys from the Ge-In-Li system, NCN, 2017-2020, contractor

-

Development of cold sprayed cermet coatings containing solid lubricant using laser surface treatment, NCN, 2018-2021, supervisor

Projects co-financed from the European Regional Development Fund

-

Development scenarios of modern technologies of metallic, ceramic and composite materials, Project ForeMat IMMS PAS task: SWOT analysis and PT of coating production technologies, 2006-2008, main contractor

-

Ceramic-metallic composites and nanocomposites for aviation and automotive industry, KomCerMet, 2009-2011, contractor

International projects

-

Amorphous alloys, relaxation, viscosity, crystallization, mechanical and other properties for application in cooperation with the Institute of Metal Science, Equipment and Technologies "Acad. A. Balevski" with Hydroaeronautics Centre of the Bulgaria Academy of Sciences, 2012-2014, contractor

Experience gained abroad

Since 2007, work connected with the activities of the Testing Laboratories Group IMIM PAN accredited by the Polish Centre for Accreditation, i.e. internal auditor in Accredited Testing Laboratories at IMMS PAS since 2007, Head of Laboratory of X-Ray Diffraction since 2016.

Co-supervisor of the doctoral thesis of M.Sc. Agata Kukuła-Kurzyniec, Institute of Metallurgy and Materials Science PAS (2016)

National and international professional experiences:

2005 Laboratoire d'Etude des Textures et Applications aux Matériaux, Université de Metz, France (1 month)

2013 Thermico GmbH&Co.KG in Dortmund, Germany - training stay within the scope of the Erasmus project (two weeks)

2014 Institute for Metal Science, Equipment and Technologies "Acad. A. Balevski" with Hydroaerodynamics Centre BAN, Bulgaria (one week)

2015 Department of Engineering "Enzo Ferrari" University of Modena and Reggio Emilia, Italy training stay within the scope of the Erasmus Plus project (one week)

2015 Department of Physical and Powder Metallurgy, Faculty of Metals Engineering and Industrial Computer Science, AGH University of Science and Technology (1 month)

2017 Department of Materials Engineering, Faculty of Mechanical Engineering of the University of Žilina, training stay within the scope of the Erasmus Plus project (two weeks)

Prizes and awards

2001/2002 - Fellowship of the Minister of National Education

2002 - M.Sc. with honour

2007 - Ph.D. with honour

2008 - Prime Minister's Award for Outstanding Doctoral Dissertation

2015 - Award of Director of IMIM PAN for the IV prize in the young scientists group assessed for scientific achievements in 2013-2014

2019 - Award of Director of IMIM PAN for the III place in the doctors as well as engineering and technical scientists group assessed for scientific achievements in 2017-2018

Organisation of conferences and scientific events

Member of the Organizing Committee of national scientific seminar: Heterogeneity of deformation in processes of mechanical working and recrystallization, IMMS PAS, Krakow 2005

Organization of the plenary session of the Division IV Technical Sciences of the Polish Academy of Sciences, IMMS PAS, Krakow 2008

Member of the Organizing Committee of the XIXth Physical Metallurgy and Materials Science Conference Advanced Materials and Technologies AMT 2010, Zakopane 2010

Organization of the national scientific seminar: Heat and mass transport in microscale, IMMS PAS, Krakow 2015

Organization of VI Symposium for Measurements and Interpretation of Stress (SPINA VI), IMMS PAS, Kraków 28-29.11.2017 r.

Membership in professional societies

Member of the Scientific Board of the Institute of Metallurgy and Materials Science of the Polish Academy of Sciences (2011-2014)

Polish Association for Materials Science (since 2015)

Secretary of the Section of Metallurgy and Metals Physics of the Metallurgy Committee of the Polish Academy of Sciences (2016-2019)

Member of the Polish Society of Microscopy (PTMi), European Microscopy Society (EMS) and International Federation of Societies for Microscopy (IFSM) (since 2017)

Reviewer

Archives of Metallurgy and Materials, Journal of Alloys and Compounds, Journal of Materials Engineering and Performance, Journal of the Chemical Society of Pakistan, Materials Characterization, Materials Science and Engineering B, Surface and Coatings Technology, Surface and Interface Analysis, Processing and Application of Ceramics, Rare Metals, Surfaces and Interfaces, Solid State Phenomena, Inżynieria Materiałowa, Engineering Review

Main scientific interest

Composite coatings with metal matrix or ceramix matrix, thermal spay technologies, X-Ray diffraction methods, electron microscopy