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## Employment and positions

Institute of Metallurgy and Materials Science, Polish Academy of Sciences: Associate Professor.

## Scientific Career

**M.Sc.:** University of Silesia in Katowice, Institute of Physics, 1977

**Ph.D.:** Warsaw Institute of Technology, Institute of Physics, 1992

**D.Sc.:** Institute of Metallurgy and Materials Science, Polish Academy of Sciences, 2012

## Scientific achievements

137 papers, among them: 60 papers in refereed journals and periodicals (45 of them cited by the Institute for Scientific Information in Philadelphia), 74 presentations during conferences, 1 monograph and 6 chapters in books.

### The most relevant publications during last 5 years

1.

Z. Starowicz, **M. Lipiński**, R.P. Socha, K. Berent, G. Kulesza, P. Ozga, Photochemical silver nanoparticles deposition on sol-gel TiO<sub>2</sub> for plasmonic properties utilization, J. Sol-Gel Sci Technol., 2015, 73, str. 563-571

2.

Z. Starowicz, G. Kulesza-Matlak, **M. Lipiński**, Optimization Studies on Enhanced Absorption in Thin Silicon Solar Cell by Plasmonic Silver Nanoparticles for the Front Side Configuration, PLASMONICS 2015, 10, str.1639-1647

3.

S. Kluska, K. Hejduk, K. Drabczyk, **M. Lipiński**, Optical properties and passivation, Physica Status Solidi A effects of silicon nitride three layer stacks deposited by plasma enhanced chemical vapor deposition, 2016, 213, str. 1839-1847.

4.

K. Drabczyk, E. Wrobel, G. Kulesza-Matlak, W. Filipowski, K. Waczynski, **M. Lipiński**, Comparison of diffused layer prepared using liquid dopant solutions and pastes for solar cell with screen printed electrodes, *Microelectronics International*, 2016, 33, 172-175.

5.

K. Drabczyk, G. Kulesza-Matlak, A. Drygała, M. Szindler, **M. Lipiński**, Electroluminescence imaging for determining the influence of metallization parameters for solar cell metal contacts, *Solar Energy*, 2016, 126, 14-21.

6.

Z. Starowicz, A. Kędra, K. Berent, K. Gawlińska, K. Gwóźdź, E. Zielony, G. Kulesza-Matlak, R.P. Socha, K. Drabczyk, E. Płaczek-Popko, **M. Lipiński**, Influence of Ag nanoparticles microstructure on their optical and plasmonic properties for photovoltaic applications, *Solar Energy* 158 (2017) 610-616.

7.

**M. Lipiński**, R.P. Socha, A. Kędra, K. Gawlińska, G. Kulesza-Matlak, Ł. Major, K. Drabczyk, K. Łaba, Z. Starowicz, K. Gwóźdź, A. Góral, E. Popko, Studying of perovskite nanoparticles in PMMA matrix used as light converter for silicon solar cell, *Arch. Metall. Mater.* 62 (2017), 3, 17331-17339.

8.

K. Gawlińska, A. Iwan, Z. Starowicz, Grazyna Kulesza-Matlak, K. Stan-Głowińska, M. Janusz, **M. Lipiński**, B. Boharewicz, I. Tazbir, A. Sikora, Searching of new, cheap, air- and thermally stable hole transporting materials for perovskite solar cells, *Opto-Electronics Review* 25 (2017) 274-284.

9.

J. Suchanicz, K. Konieczny, K. Świerczek, **M. Lipiński**, M. Karpierz, D. Sitko, H. Czternastek, K. Kluczeńska, Electrical transport in low-lead (1-x)BaTiO<sub>3</sub>-xPbMg<sub>1/3</sub>Nb<sub>2/3</sub>O<sub>3</sub> ceramics, *Journal of Advanced Ceramics* 2017, 6(3): 207-219.

10.

G. Kulesza-Matlak, K. Gawlińska-Nęcek, Z. Starowicz, A. Sypień, K. Drabczyk, B. Drabczyk, **M. Lipiński**

, P. Zięba, Black silicon obtained in two-step short wet etching as a texture for silicon solar cells - surface microstructure and optical properties studies, Archives of Metallurgy and Materials, 2018, 63, 1009-1017.

11.

Z. Starowicz, K. Gawlińska-Nęcek, J. Walter, R.P. Socha, G. Kulesza-Matlak, **M. Lipiński**, Extended investigation of sol aging effect on TiO<sub>2</sub> electron transporting layer and performances of perovskite solar cells, Materials Research Bulletin, 2018, 99, 136-143.

12.

K. Gawlińska-Nęcek, Z. Starowicz, D. Tavgeniene, G. Krucaite, S. Grigalevicius, E. Schab-Balcerzak, **M. Lipiński**, A solution-processable small-organic molecules containing carbazole or phenoxazine structure as hole-transport materials for perovskite solar cells, OPTO-ELECTRONICS REVIEW, 2019, 27(2), 137-142.

13.

S. Kula, A. Pająk, A. Szłapa-Kula, A. Mieszczanin, A. P. Gnida, **M. Lipiński**, E. Schab-Balcerzak, 9,9'-bifluorenylidene derivatives as novel hole-transporting materials for potential photovoltaic applications, DYES AND PIGMENTS, 2020, 174, 108031, DOI: doi.org/10.1016/j.dyepig.2019.108031

#### Chapters in monographs during last 5 years

1.

**M. Lipiński**, *Charakterystyka ogniw słonecznych, w: Problemy Metrologii Elektronicznej i Fotonicznej 9*. Praca zbiorowa pod redakcją Janusza Mroczki, ISBN

978-83-7493-029-1, 2018, pp. 131-202

2.

**M. Lipiński**, P. Zięba, *Stan obecny i perspektywy rozwoju ogniw perowskitowych, Biała Księga Innowacji w Fotowoltaice Polskiej*, Praca pod redakcją Dr. inż. K. Drabczyka, 97-111.

3.

**M. Lipiński**, G. Kulesza-Matlak, K. Drabczyk, P. Panek, Z. Starowicz, K. Gawlińska, P. Zięba, *Materiały i technologie dla fotowoltaiki*, 65 lat Instytutu Metalurgii i Inżynierii Materiałowej im. Aleksandra Krupkowskiego Polskiej Akademii Nauk, 1952-2017, rozdział w monografii, Kraków 2017, s. 247-267.

4.

K. Drabczyk, J. Domaradzki, M. Godlewski, D. Kaczmarek, **M. Lipiński**, M. Mazur, A. Michałek, K. Sieradzka, T. Stapiński, D. Szymonik, D. Wojcieszak, P. Zięba, *Biała księga innowacji w fotowoltaice polskiej*, Praca zbiorowa pod redakcją Kazimierza Drabczyka, ISBN 978-83-60768-49-5, Grafpol Wrocław 2018, pp. 140

## Patents

Patent no. 21397 for the invention: The method of crystalline silicon surface texturization, 27.01.2010.

## Prizes and awards

2013 - **Siemens Special Award** granted at the request of the Jury of 06.05.2013 for the

habilitation thesis: "*The influence of physical properties of the subsurface layers and areas on operational parameters of silicon solar cell*"  
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2017 - Silver Cross of Merit.

## Research Projects

### Projects from Ministry of Science and Higher Education

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Designing and production of functionally graded materials (Project No. PBZ-KBN 100/TO8-2003): Subject 1: Designing and technology elaboration of functionally graded materials for the application in fotonics and fuel cells, Task 2: Elaboration of technology of antireflection gradient coatings in silicon solar cells, IMMS PAS, task leader of task 2, 2004-2007

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Neutron doped multicrystalline silicon applied for solar cells, (Project No. N508 04831/2569), IAE (Świerk), task leader, 2006-2008.

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The characterisation of the multicrystalline silicon modified with processes of gettering and passivation for the photoelectric cells applications, (Project No. N N515 088 433), participant, IET (Warsaw), 2007-2009

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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, supervisor, 2008-2010

Projects from National Centre for Science

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Synthesis and characterizing new materials for perovskite solar cells, Project funded under „OPUS”, consortium IMIM PAN -UŚI in Katowice, 2018/31/B/ST8/03294, supervisor, 2019 - 2022.

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Investigation of influence of metal and semiconductor nanoparticles on opto-electronic properties of composite materials, Project funded under „OPUS”, 2012/05/B/ST8/00087, IMIM PAS, supervisor, 2012-2016

Projects from National Centre for Research and Development

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PV-In-line processing of n+/p and p/p+ junction systems for cheap photovoltaic module production (Inline), Polish-Norwegian Research Programme, No. POL-NOR/199380/89/2014, participant, (2014-2016)

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Isothermal and refrigeration photovoltaic car body (WOLTER), GEKON Programme - Generator of Ecological Concepts, participant, (2014-2016)

Common research within the scientific network

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EKOENERGIA- New ecological and save technologies in energy production and conversion, IMP PAS, participant, 2006-2007

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PV-TECH- Development of new technologies and research techniques for silicon solar cells, IMMS PAS, participant, 2008

International exchange programmes

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Application of macroporous silicon to silicon solar cells, Laboratoire de Chimie Metallurgique des Terres Rares, CNRS, Thiais, Francia, 2003-2005.

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Analyse et élaboration de couches de nitrure de silicium pour application photovoltaïques, Laboratoire Physique de la Matiere - I.N.S.A, Regional Project MIRA, Lyon, 2006 -2007

Structural Funds

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Operational Programme Human Capital, co-financed by European Social Fund, Dissemination of Polish and world achievements in photovoltaics in the education process at high level (No. UDA-POKL.04.02.00-00-053/08-00), IMMS PAS, participant, 2009-2010

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Operational Programme Human Capital, co-financed by European Social Fund, Dissemination of Polish and world achievements in photovoltaics in the education process at high level - II Edition (No. UDA-POKL. 04.02.00-00-006/09-00), IMMS PAS, participant, 2010-2011

### **Experience gained abroad**

French Government Scholarship: Laboratoire Physique du Solide et Energie Solaire, C.N.R.S, Valbonne, Laboratoire Physique de la Matiere, I.N.S.A, Lyon 1987-1988 (8 months)

Laboratoire PHASE-CNRS, Strasbourg, Francja, 1992 (3 months)

#### Some shorter visits:

Laboratoire de Photoélectricité des Semiconducteurs, Univ., Maresille, Francja, 1992 (2 weeks),

Laboratoire PHASE- CNRS, Strasbourg, Francja, 1992 (2 weeks)

Institut für Physikalische Elektronik, Universität Stuttgart, Stuttgart, Niemcy, 2007, (1 week)

### **Main scientific interest**

Solar cell device physics and technology, third generation photovoltaics, nanotechnology, plasmonics, nanostructured materials, perovskite solar cells