

Curriculum vitae – Peter Petrik, 2017

Personal data

- *Address:* MTA – Hungarian Academy of Sciences
EK – Centre for Energy Research
MFA – Institute for Technical Physics and Materials Science
Photonics Department
Konkoly Thege Rd. 29-33, 1121 Budapest
- *Contacts:* E-mail: petrik.peter@energia.mta.hu
Tel.: +36 1 3922502
- *Date of birth:* 22 March 1970
- *Citizenship:* Hungarian
- *Marital status:* married, two children

Education

- 1994 M.Sc. in Engineering
Faculty of Electrical Engineering, Technical University of Budapest
- 2000 Ph.D. in Physics
Chair of Experimental Physics, Technical University of Budapest
Chair of Electron Devices, Friedrich-Alexander University, Erlangen, Germany
MFA
- 2015 DSc (Habilitation) in Engineering

Employment

- 1995 Junior researcher (MFA)
- 2000 Research fellow (MFA)
- 2003 Senior researcher (MFA), Head of Ellipsometry Laboratory
- 2016 Scientific advisor (EK MFA), Head of Photonics Department

Research grants and projects

- Volkswagen Project ((1997-1999), supported by the Volkswagen Foundation, “Development of optical models for polysilicon layers at high temperature for in situ spectro-ellipsometric measurements during chemical vapor deposition”; project coordinator
- OTKA Postdoctoral Grant (2000-2003), Hungary, “Characterization of polysilicon films using spectroscopic ellipsometry”, principal investigator
- EU IST-2000-29352, FECLAMplus (2001-2003), “Ferroelectric CVD layers for Memory Applications; MFA coordinator
- Bolyai Grant (2003-2005), MTA Hungary, principal investigator
- OTKA K61725 (2006-2009): Ellipsometric modeling of nanograin structures and thin films for biological and (opto)electronical applications; principal investigator
- EU FP6 ANNA (2007-2010), “European Integrated Activity of Excellence and Networking for Nano and Micro-Electronics Analysis” - establishment of the accredited Ellipsometry Laboratory of MFA (<http://www.ellipsometry.hu>); MFA coordinator
- PVMET08 (2008-2011), Hungarian NKTH project; “Development of metrology tools based on electrical and optical techniques for in-line and laboratory qualification of thin film solar cells”; participant
- EU STREP FP7, P3SENS (2010-2012), “Polymer photonic multiparametric biochemical sensor for point of care diagnostics”; participant
- Bolyai Grant (2010-2011), MTA Hungary, principal investigator
- OTKA K81842 (2010-2012), “Protein and nanocrystalline semiconductor layers for sensors and photovoltaics”; principal investigator
- EU FP7 EMRP Researcher Excellence Grant (2012) at the Fraunhofer IISB, “Metrology for thin films”; principal investigator at IISB

- EU FP7 EMRP Researcher Excellence Grant (2013) at the TU Delft, Netherlands, "Scatterometry"; TU Delft coordinator
- OTKA K115852 (2015-2018), "Development and optical monitoring of nanostructures for sensing"; principal investigator
- Further projects: <http://www.ellipsometry.hu/projects.html>

Guest research

- 1994 Friedrich-Alexander University (FAU) and Fraunhofer IISB, Germany, 6 months, TEMPUS Grant for diploma
- 1995 FAU and IISB, Germany, 1 year, DAAD Grant for PhD
- 1996 FAU and IISB, Germany, 2 months, Soros Grant
- 1997 FAU and IISB, Germany, 3 months, DAAD Grant
- 2000 FAU and IISB, Germany, 4 months, Eötvös Grant
- 2006 University of Toledo, USA, 6 months, HAESF Grant
- 2012 Fraunhofer IISB, Germany, 12 months, EMRP Researcher Excellence Grant
- 2013 Delft University of Technology, Netherlands, 12 months, EMRP Researcher Excellence Grant
- 2016 Federal Institute for Materials Research and Testing (BAM), Germany, 2 months, DAAD Grant

Invited talks in the last 3 years

- **P. Petrik** and E. Agocs, „High Sensitivity Optical Characterization of Thin Films with Embedded Si Nanocrystals”, ECS Meeting, Toronto, Canada, May 12-16, 2013.
- **P. Petrik**, E. Agocs, B. Fodor, T. Lohner, and M. Fried, „Parameterization of the dielectric function of semiconductor nanocrystals around the critical points”, XXII International Materials Research Congress, Cancun, Mexico, August 11-15, 2013.
- **P. Petrik**, N. Kumar, E. Agocs, B. Fodor, O. El Gawhary, S. F. Pereira, T. Lohner, M. Fried, H. P. Urbach, „Optical characterization of lateral and vertical structures”, Workshop on traceable optical thin film characterization, Berlin, Germany, September 12, 2013.
- **P. Petrik**, G. Juhasz, C. Major, O. Polgar, E. Agocs, B. Fodor, T. Lohner, M. Fried, „Optical mapping and depth profiling using polarized light”, International Congress of Metrology, Paris, October 7-10, 2013.
- **P. Petrik**, N. Kumar, E. Agocs, B. Fodor, S. F. Pereira, T. Lohner, M. Fried, H. P. Urbach, “Optical characterization of laterally and vertically structured oxides and semiconductors”, SPIE Photonics West, San Francisco, USA, February 1-6, 2014.
- **P. Petrik**, B. Fodor, E. Agocs, J. Nador, N. Kumar, G. Juhasz, C. Major, S. F. Pereira, H. P. Urbach, M. Fried, “Optical characterization of macro-, micro- and nanostructures using polarized light”, 18th School on Condensed Matter Physics, Varna, Bulgaria, September 1-6, 2014.
- **P. Petrik**, B. Fodor, E. Agocs, P. Kozma, J. Nador, N. Kumar, G. Juhasz, C. Major, S. F. Pereira, H. P. Urbach, M. Fried, “Ellipsometry at macro- micro- and nanoscales”, Workshop Ellipsometry, Twente, Netherlands, February 23-25, 2015.
- **P. Petrik**, B. Fodor, E. Agocs, P. Kozma, J. Nador, N. Kumar, J. Endres, G. Juhasz, C. Major, S. F. Pereira, H. P. Urbach, B. Bodermann, M. Fried, “Methods for optical modeling and cross-checking in ellipsometry and scatterometry”, SPIE Conference, Munich, Germany, June 22-25, 2015.
- **P. Petrik**, B. Fodor, E. Agocs, B. Kalas, J. Nador, P. Kozma, G. Juhasz, C. Major, M. Fried, “Methods for optical modeling and cross-checking”, 7th International Workshop on "Advanced optical and X-ray characterization techniques of multifunctional materials for information and communication technologies, sensing and renewable energy applications", Bucharest, Romania, September 16-18, 2015.
- M. Fried, C. Major, G. Juhasz, **P. Petrik**, Z. G. Horvath, “Characterization of photovoltaic devices by spectroscopic ellipsometry”, 7th International Workshop on "Advanced optical and X-ray characterization techniques of multifunctional materials for information and communication technologies, sensing and renewable energy applications", Bucharest, Romania, September 16-18, 2015 (presenting author).
- M. Fried, C. Major, G. Juhasz, **P. Petrik**, Z. G. Horvath, “Expanded beam spectroscopic ellipsometry for big area in-line monitoring”, Spring Meeting of the European Materials Research Society, Lille, France, May 11-15, 2015.
- **P. Petrik**, E. Agocs, B. Kalas, P. Kozma, J. Nador, M. Fried, “Improvement of Instrumentation for Bioellipsometry”, 7th International Conference on Spectroscopic Ellipsometry (ICSE-7), Berlin, Germany, June 6-10, 2016.
- **P. Petrik**, B. Fodor, E. Agocs, T. Lohner, B. Bardet, T. Defforge, F. Cayrel, D. Alquier, G. Gautier, M. Fried, “Characterization of porous and nanostructured materials by ellipsometry”, Energy, Materials and Nanotechnology (EMN) meeting, Prague, Czech Republic, June 13-17, 2016.
- **P. Petrik**, E. Agocs, B. Kalas, B. Fodor, T. Lohner, J. Nador, A. Saftics, S. Kurunczi, T. Novotny, E. Perez-

Feró, R Nagy1, A Hamori, R Horvath, Z Hózer, M Fried, "Nanophotonics of biomaterials and inorganic nanostructures", International School on Condensed Matter Physics (ISCMP), Varna, Bulgaria, August 29 - September 2, 2016.

Awards and prizes

- 2000 Prize of the Hungarian Academy of Sciences for Young Researchers
- 2001 Postdoctoral Prize of MFA
- 2007 Paul Drude Award (<http://petrik.ellipsometry.hu/drude-petrik.pdf>)
(*First winner of the Drude Award founded at the 4th International Conference of Spectroscopic Ellipsometry in 2007 for "exceptional contributions to the development and application of spectroscopic ellipsometry" in a range of applications including ion implanted and polycrystalline silicon.*)

Publications and presentations

- 4 book chapters, 185 articles
- 28 talks at international conferences (18 invited)
- Principal symposium organizer at the 2012 Fall Meeting of the European Materials Research Society
(*Highly precise characterization of materials for nano and bio technologies, September 17-21, Warsaw, Poland*)
- Program co-chair of the 3rd International Conference on Spectroscopic Ellipsometry (July 6-11, 2003, Vienna, Austria)
- Advisory and program committee member of numerous other conferences

Research

- Optical metrology of thin films and nanostructures
- *In situ* optical studies for biology and sensorics
- Development of instrumentation for ellipsometry
- Leader of the establishment of the accredited ellipsometry laboratory of MFA
- Major results of the last 5 years: developments in bio-ellipsometry including instrumentation, flow cells, evaluations; models and improved characterizations for nanostructures, dielectric function parameterizations, evaluation strategies; development of optical metrology tools for mapping ellipsometry and scatterometry; development of optical metrology for the characterization of biological, nanostructured and photonic thin films for sensorics.

Teaching

- *University courses:* „Microelectronics and Technology” (Friedrich-Alexander University, Erlangen, Germany, 1994); „Elektrotechnik” (Technical University of Budapest, 1996-97); „Metrologies of material properties” (Eötvös Loránd University, Budapest, 2006-)
- *Supervision of students:*
 - * Peter Kozma, PhD
 - * Emil Agócs, PhD
 - * Bálint Fodor, PhD, MSC
 - * Judit Nádor, PhD
 - * Andrea Németh, MSC, BSC
 - * István Mohácsi, MSC
 - * Tímea Hülber, BSC
 - * Milán Janosov, BSC
 - * Zoltán Betyák, BSC
 - * Veronika Cotrau, BSC
 - * Bálint Éles, BSC
 - * Olívia Kozák, BSC
 - * Enikő Molnár, BSC

Memberships

- Eötvös Loránd Physical Society
- Bohmische Physical Society
- Scientific Committee of MFA

Languages

- Fluent in English and German

Further information

- List of publications: <https://vm.mtmt.hu/search/slist.php?kozid=11832&>
- Personal homepage: <http://petrik.ellipsometry.hu>
- List of projects: http://petrik.ellipsometry.hu/projects_en.html