

Ing. at Ing. Vilém Neděla, Ph.D.

born in 1976

Education, pedagogical and academic degrees:

- 2001 - 2008 Brno University of Technology, doctoral study
Electrical Engineering and Communication (Micro-electronics and Technology)
Doctoral thesis: Signal detection in scanning and environmental scanning electron microscopy (supervisor Prof. Rudolf Autrata)
The thesis was awarded the prize: Czechoslovak Microscopy Society
- 2000 - 2003 University of Technology, Master's study
Faculty of Business and Management
Branch: Production management
- 1997 - 2001 University of Technology, Master's study
Faculty of Electrical Engineering and Communication
Branch: Electrical Manufacturing and Management

Employment:

- 2011-present Institute of Scientific Instruments of the ASCR, v.v.i.,
Královopolská 147, Brno
Head of the Research Group Environmental Electron Microscopy.
- 2011-present Department of Electrical and Electronic Technology at BUT Brno,
Technická 10
Assistant Professor-electron microscopy, detection systems
- 2006 – 2011 Institute of Scientific Instruments of the ASCR, v.v.i. Královopolská
147, Brno
Head of the Detection Systems Research Group
- 2001-present Institute of Scientific Instruments of the ASCR, v.v.i. Královopolská
147, Brno
Ph.D. student, researcher
- 1993 - 1996 I & C Energo, Třebíč
Measuring and regulation mechanic

Key research results:

- Development of a new HAADF detector for the Hitachi transmission electron microscope [author]
- Development of a new scintillation detector for environmental scanning electron microscope (ESEM) [patent co-author]
- Leader of the group which designed, developed and manufactured BSE-YAG detector for the FEI company (approximately 6 units)
- Leader of the group that designed, developed and manufactured the prototype of BSE-YAG detector for Jeol JSM 5600LV microscope (for Gedeon Richter company – Hungary)
- Leader of the group that designed, developed and manufactured BSE-YAG detectors for Hitachi (approximately 25 units)
- Leader of the group that designed, developed and manufactured BSE-YAG detectors for Jeol company (approximately 15 units)

Leader of the group that designed, developed and manufactured the BSE-YAG detector for Jeol JIB 4600

Leader of the group that designed and developed the prototype in-lens BSE-YAG detector for Jeol company

Leader of the group that designed, developed and manufactured the prototype of a new lightguide for the BSE-YAG detector for Hitachi company (1pc)

Development of a new ionization detector SE with electrostatic separator [author of the patent and prototype]

Development of new edge-free scintillation BSE detector for SEM, Hitachi, Japan [co-author of the prototype]

Development of a new method for long-term study of biological samples in ESEM [author of the new method]

Development of a new method for the study of somatic embryogenesis of plants in ESEM [co-author of the method]

The author of the conversion of a Vega (Tescan) electron microscope to an experimental Environmental SEM AQUASEM II. (author of the conversion)

The author and co-author of many prototypes and functional samples

Research results:

Publications: prestigious science journals with IF: 32, magazines without IF: 17

Conferences: proceedings approx. 125, lectures 12/invited 9/poster about 110

The number of granted patents-2: Patent number: 299864 (granted - 2008), EU patent no. 2195822 (granted -2011)

The number of prototypes and functional samples: 17

The number of citations according to WoS: 70, H-index according to WoS: 5

Projects worked on (S- solver, C - co-solver):

S — MŠMTCZ. 1.07/2.3.00/20.0103: 09/2011-09/2014

S — GACR GP102/10/1410: 01/2010-12/2013

S — GAAV KJB200650602: 01/2006 - 12/2008

S — GACR GA14-22777S: 01/2014-12/2016

S — CAS, Grant for purchasing of expensive scientific instruments: 2015

C — BAS Collaboration Voucher, Cambridge University (2015)

C — MPO: FR-TI1/118: 5/2009 - 4/2013

C — MPO: FR-TI1/305: 7/2009 - 6/2013

C — MPO: FT-TA/050: 11/2004 - 12/2007

The total volume of contract research:

Head of Contract Research Orders, worth approx. CZK 6,000,000, (2006-2011).

Cooperation with companies: Jeol, Hitachi, FEI, BVT Technologies, Tescan, Solartec, Gedeon Richter, BD Sensors, Arrow International, etc.

Appraisal of the scientific community:

2003 Preciosa Foundation Grant

- 2009 Czechoslovak Society of Microscopy Award for the best doctoral thesis including significant use of microscopy techniques
- 2009 The Best Poster Award at the European Congress of Microscopy, Gratz, Austria
- 2011 The Best Poster Award at the European Congress of Microscopy, Urbino, Italy

Invited lectures, chairmanship, media presentations:

- 2006 Media presentation within the series of Scientific programmes "Czech Head"
- 2007 Invited lecture at the New Methods, Instrumentation and Ideas for Microscopy and Microanalysis in Forensic Science Conference 2007
- 2007 Invited lecture at the IX. Central European Symposium Brno Implantology symposium
- 2008 Invited lecture at the New Methods, Instrumentation and Ideas for Microscopy and Microanalysis in Forensic Science Conference 2008
- 2010 Lecture at CPO-8 International Conference, Singapore.
- 2012 Invited lecture at the Asia-Pacific Microscopy Conference, Australia.
- 2012 Lecture at the workshop of BVT Technologies a.s.
- 2012 Invited lecture on application possibilities of Environmental scanning electron microscopy in science, research and industrial applications. Biotechnology Companies Congress, Senate of the Parliament of the Czech Republic, Prague.
- 2015 Invited lecture at the Microscopy and Microanalysis Congress, Portland, Oregon, USA.
- 2015 Several interviews for Czech Television, Czech radio and magazines – (New laboratory of ESEM in ISI CAS, Head of organization committee and lecture of Autumn School of Electron microscopy).
- 2016 Chair of the scientific section I-5 (In situ dynamics in TEM and SEM, Environmental microscopy), 11th Asia-Pacific Microscopy Conference, May 23-27, Puket, Thailand.

Selected Papers:

Neděla, Vilém ; Tihlaříková, Eva ; Hřib, Jiří. The Low-Temperature Method for Study of Coniferous Tissues in the Environmental Scanning Electron Microscope. *Microscopy Research Technique*. 2015, 78, No. 1, 13-21.

Krausko, J. ; Runštuk, Jiří ; Neděla, Vilém ; Klán, P. ; Heger, D. Observation of a Brine Layer on an Ice Surface with an Environmental Scanning Electron Microscope at Higher Pressures and Temperatures. *Langmuir*. 2014, 30, No. 19, 5441-5447

Tihlaříková, Eva ; Neděla, Vilém ; Shiojiri, M. In Situ Study of Live Specimens in an Environmental Scanning Electron Microscope. *Microscopy and Microanalysis*. 2013, 19, No. 4, 914-918.

Flodrová, E.; Neděla, V., Sedláčková, M., Hampl. A Comparative Study Of Human Embryonic Stem Cell Surface Structure Using SEM And ESEM. *Microscopy and Microanalysis*, 2012 (18), Suppl 2, s. 1268-1269. ISSN: 1431- 9276.

Neděla, V.; Svidenská, S. Environmental Scanning Electron Microscope As A Tool For Imaging Of Native State Somatic Embryogenesis. *Microscopy and Microanalysis*, 2012 (8), č. Suppl 2, s. 1270-1271. ISSN: 1431- 9276.

JIRÁK, J.; ČUDEK, P.; NEDĚLA, V. Scintillation Secondary Electron Detector For ESEM and SEM. *Microscopy and Microanalysis*, 2012 (18), č. Suppl 2, s. 1266-1267. ISSN: 1431-9276.

Maxa, J.; Neděla, V.; Jiráček, J. Analysis Of Gas Flow In The New System Of Apertures In The Secondary Electron Scintillation Detector For ESEM. *Microscopy and Microanalysis*, 2012(18), č. Suppl 2, s. 1264-1265. ISSN: 1431- 9276.

Neděla, V. ; Konvalina, I. ; Lencová, B. ; Zlámal, J. Comparison of calculated, simulated and measured signal amplification in variable pressure SEM. *Nuclear Instruments & Methods in Physics Research Section A*, 2011, Roč. 645, č. 1, s. 79-83. ISSN 0168-9002.

Jiráček, J. ; Čudek, P. ; Neděla, V. Detection of Secondary Electrons by Scintillation Detector at VP SEM. *Microscopy and Microanalysis*, 2011, Roč. 17, Suppl. 2, s. 922-923. ISSN 1431-9276.

Neděla, V. ; Konvalina, I. ; Lencová, B. ; Zlámal, J. Simulation of Energy Selective signal Amplification in Gas Environment of Variable Pressure SEM. *Microscopy and Microanalysis*, 2011, Roč. 17, Suppl. 2, s. 920-921. ISSN 1431-9276.

Jiráček, J. ; Neděla, V. ; Černochoch, P. ; Čudek, P. ; Runštuk, J. Scintillation SE detector for variable pressure scanning electron microscopes. *Journal of Microscopy*, 2010, Roč. 239, č. 3, s. 233-238. ISSN 0022-2720.

Neděla, V. Controlled dehydration of a biological sample using an alternative form of environmental SEM. *Journal of Microscopy*, 2010, Roč. 237, č. 1, s. 7-11. ISSN 0022-2720.

Neděla, V. Methods for Additive Hydration Allowing Observation of Fully Hydrated State of Wet Samples in Environmental SEM. *Microscopy Research Technique*, 2007, Roč. 70, č. 2, s. 95-100. ISSN 1059-910X.

Neděla, V. ; Roubalíková, L. ; Černochoch, P. Study of Tooth Root Surface Treated with Various Techniques Using Variable Pressure SEM. *Microscopy and Microanalysis*, 2007, Roč. 13, Suppl. 3, s. 234-235. ISSN 1431-9276.

Neděla, V. ; Weyda, F. ; Černochoch, P. Advantages of Study of Amber Fossils with Ionization Detector in Variable Pressure SEM. *Microscopy and Microanalysis*, 2007, Roč. 13, Suppl. 3, s. 250-251. ISSN 1431-9276.

Ježek, J. ; Čižmár, T. ; Neděla, V. ; Zemánek, P. Formation of long and thin polymer fiber using nondiffracting beam. *Optics Express*, 2006, Roč. 14, č. 19, s. 8506-8515. ISSN 1094-4087.