

## **Malgorzata Celuch: Education, Career, Selected Technical Activities until 2020**

**Nationality:** Polish

**Languages spoken:** Polish (native), English (fluent), Russian, Italian

### **Degrees:**

- 1996 Ph.D. (honours)  
from: Warsaw University of Technology  
thesis title: "A generalised approach to the FDTD and TLM algorithms for microwave circuit modelling"  
advisor: Prof. Wojciech Gwarek
- 1988 M.Sc. (honours)  
from: Warsaw University of Technology  
thesis title: "Numerical analysis of planar circuits incorporating nonlinear components"  
advisor: Prof. Wojciech Gwarek
- 1983 International Baccalaureate (distinctions)  
from: United World College of the Atlantic, UK, and IB Office, Switzerland

### **Career/Employment:**

#### **recent:**

- 2017→ President / General Director of QWED Sp. z o.o. company [www.qwed.eu](http://www.qwed.eu)  
1999-2017 co-founder & vice-president (honorary) of QWED  
1996-2017 Assistant Professor, Warsaw University of Technology, Institute of Radioelectronics  
1994→ free-lance electromagnetic software developer

#### **former:**

- 1989-1992 free-lance researcher – maternity leave from the Warsaw University of Technology  
1992-1996 doctoral studies, Warsaw University of Technology

### **Specialisation:**

- main fields: computational electromagnetics, multiphysics modelling  
modelling-based material measurements in GHz frequency range
- other fields: microwave & millimeter wave circuits and antennas  
microwave heating appliances, composites, nanomaterials

### **Awards for excellence in research and /or innovation:**

- 2010 Rector of the Warsaw University of Technology Scientific Award */WUT team/*  
2001, 2006 Leader in Software Export  
(Polish Software Market Association) */QW team/*  
2000 Proton Award  
(State Committee for Scientific Research and Proton TV programme) */QW team/*  
2000 Master of Technology Award  
(NOT - Polish Federation of Engineering Associations) */QW team/*  
1999 Prime Minister of Poland Award */QW team/*  
1998 European Information Technology Prize  
(European Commission and Euro-Case) */QW team/*  
1997 Rector of the Warsaw University of Technology Award */individual/*  
1996 Scholarship of the Foundation for Polish Science */individual/*  
1995 Minister of Education Award */WUT team/*

Note: notes in brackets (..) denote awarding bodies,  
*/WUT team/* denotes a team of 3-4 researchers at WUT,  
*/QW team/* denotes a team of 4 main authors of QuickWave software or their QWED SME.

**Other awards:**

2009 IEEE IMS 2009 Highest Quality Workshop Award  
for the Workshop "*Recent Advances in Microwave Power Applications and Techniques*"  
[http://www.qwed.eu/ieee2009\\_ram.html](http://www.qwed.eu/ieee2009_ram.html) /with co-chair/

**Reviewer for:**

*IEEE Transactions on Microwave Theory & Techniques* (since 1996)  
*IEEE Transactions on Antennas and Propagation* (since 1997)  
*IEEE Transactions on Instrumentation and Measurement* (since 2018)  
*IEEE Microwave and Wireless Components Letters* (since 2001)  
*Journal of Microwave Power and Electromagnetic Energy* (since 2006)  
*Applied Computational Electromagnetics Society Journal* (since 2007)  
*IEEE Antennas and Propagation Society Magazine* (since 2008)  
*International Journal of Infrared and Millimeter Waves* (since 2008)  
*Physica Status Solidi B* (since 2008)  
*Computer Physics Communications* (2009)  
Wydawnictwa Komunikacji i Łączności (2009)

TPRC member of *IEEE MTT-S International Microwave Symposium* since 2002

Chair and initiator of Subcommittee "*High Power Microwave Processing*" 2009-2015

TPC member of: *Microwave Materials & Applications Conference MMA-2010, ANTEM-2010*,  
IET Conference on *Computational Electromagnetics CEM 2011*  
*Microwave & Radar Week - MIKON 2020*

Expert for the European Commission R&I Programmes (since 2008)

Helsinki University of Technology, Finland – pre-examiner of Ph.D. Thesis in 2001

McMaster University, Canada – external reader of Ph.D. thesis in 2010

**Teaching experience – Warsaw University of Technology until 2017:**

*Fields, Waves and Antennas EFWA* (lecturer in charge)  
*Computational Electromagnetics for Telecommunications* (lecturer in charge)  
*Pola i Fale POFA* (with Prof. W.Gwarek)  
*Komputerowa Analiza Problemów Elektrodynamiki* (with Prof. W.Gwarek)  
*Oddziaływanie fal elektromagnetycznych na organizmy żywe* (co-lecturer)  
author of laboratory exercises for POFA, EFWA  
contributions to other courses in computational electromagnetics and microwave theory

**Teaching experience – international and foreign universities:**

Franco-Polish High School of New Information and Telecommunication Technologies, Poznan  
tutorials and laboratory exercises in electronic circuit theory, 1992-1993  
Chalmers University of Technology, Gothenburg, Sweden  
contractual consultancy on FDTD modelling for mobile communications, 1995-1996  
Chalmers University of Technology, Gothenburg, Sweden  
*Microwave Modelling with the FDTD method*  
graduate level lectures, Nov.1995  
University of Guadalajara, Guadalajara, Mexico  
*Computational Electromagnetics*  
Ph.D. course (co-taught with Prof. W.Gwarek), Feb.2005  
California Institute of Technology, Pasadena, CA  
*Electromagnetic Software Applications to Antenna Problems*  
M.Sc. / Ph.D. lecture and tutorials, Jan.2007

Worcester Polytechnic Institute, Worcester, MA

*The finite-difference time-domain algorithms: numerical properties & practical applications*  
lectures within graduate course, Apr.2008

McMaster University, Hamilton, Canada

*Non-Standard Features of the FDTD Technique & Their Implementation in QuickWave Software*

graduate lectures, May 2010

**Co-organiser and tutor of professional training courses:**

Chalmers University of Technology, Gothenburg, Sweden

*QuickWave Modelling*

3 days (co-taught with Prof. W.Gwarek), Nov.1999

Northampton Community College, Bethlehem, PA

*Electromagnetic Modelling for Microwave Heating*

2 days (co-taught with Dr. V.Yakovlev), Jan.2002

Swedish Institute for Food and Biotechnology, Gothenburg, Sweden

*QuickWave Electromagnetic Software Application*

2 days (co-taught with Prof. W.Gwarek), May 2002

The Ferrite Company, Inc., Hudson, NH

*Advanced & Specialised Training in QuickWave-3D*

1 day (co-taught with dr. V.Yakovlev), Jan.2003

Politechnika Wroclawska, Wroclaw

*Modelowanie Elektromagnetyczne Układów Mikrofalowych i Antenowych Symulatorem FDTD*

2 days (co-taught with prof. W.Gwarek), Apr.2006

**Invited speaker at seminars in academic and industrial institutions:**

Ferdinand-Braun-Institut für Höchstfrequenztechnik, Berlin, Germany, Oct.1993

University of Victoria, Victoria, Canada, June 2001

Technische Universität Darmstadt, Darmstadt, Germany, July 2002

*Whirlpool*, Norrkoping, Sweden, Aug.2003

Chalmers University of Technology, Gothenburg, Sweden, Nov.1998, Feb.2003

Dalhousie University, Halifax, Canada, June 2005

Stellenbosch University, Stellenbosch, RPA, Sep.2005

California Institute of Technology, Pasadena, CA, Jan.2007

Jet Propulsion Laboratory, Pasadena, CA, Jan.2007

*Nestle PTC*, Singen, Germany, Aug.2007

Worcester Polytechnic Institute, Worcester, MA, Jan.2002, Jan.2009

**Invited speaker at scientific conferences:**

*MIKON*, May 1998

*East-West Workshop "Advanced Techniques in Electromagnetics"*, May 2004

*Computer Modelling & Microwave Power Industry*

June 2000, Jan.2003, Jan.2004, Feb.2008, Jan.2009

*American Ceramics Society - EMA* Jan. 2020

**Invited speaker / panelist at business and policy-making events:**

Polish Software Market Association:

*Leader in Software Export Event*, Mar.2001

European Network for Financing Food Innovation:

*Roundtable Meeting*, Warsaw, Sep.2006

IEEE MTT-S Winter Technical Panel Session:  
*Government Support for MTT Research*, Long Beach, CA, Jan.2007  
European Commission and OSEO Conference:  
*Consolidating Research and Innovation for European SMEs*, Paris, Sep.2008  
European Materials Modelling Council  
*Economic Impact of Materials Modelling*, Turin, July 2019  
IEEE MTT-S Conf. Numerical Electromagnetic & Mutliphysics Modeling & Optimisation  
*Women in NEMO panel session*, Boston-Cambridge, June 2019

**Session / workshop organiser:**

*Applied Computational Electromagnetics Society Symp.* – sessions in 2007, 2008, 2010  
*IEEE MTT-S International Microwave Symp.* – workshop in 2009 (Best Workshop Award)  
*Material & Impedance Measurement Techniques* - MIKON Workshop Oct. 2020  
*Women in Microwaves* - first-ever session at MIKON, Oct.2020

**Session chair at scientific conferences:**

20+ sessions at *IEEE IMS, APMC, NEMO; ACES, AMPERE, MIKON*  
co-founder of SC-33 (a new “*High Microwave Power Applications*”  
subcommittee at *IEEE MTT-S IMS*) in 2010 and its chair/ co-chair till 2014

**Managerial experience:**

QWED President since 2017 (Vice-President 1997-2017)  
leading European projects

- at QWED: Eureka E!2602 MICRODEFROST, STREP FP6 CHISMACOMB and SOCOT, MNT ERA-NET NACOPAN, Eureka FoodWaste, MMAMA, NanoBat
- at WUT (Marie Curie ToK, ENIAC HEECS)

leading industrial projects at WUT and QWED

**Professional organisations:**

IEEE member since 1996  
co-chair IEEE AES/AP/MTT Joint Chapter, Section Poland, 2007-2008  
member IEEE MTT-S TC-1 (Field Theory & Computational Electromagnetics) since 2019  
co-chair IEEE PS Women in Engineering AF (since 2020)  
European Materials Modelling Council - co-chair Focus Area *Model Development* (since 2020)

**Other voluntary organisations:**

founding member of Polish UWC Association (Towarzystwo Szkół Zjednoczonego Świata):  
member of National Committee selecting students for United World Colleges since 2001  
member of Board of Audit 2009-2011

**Other public / medial appearances:**

in TV programmes "Luz", "Styl życia" – several appearances in 1990s  
in radio programmes – several broadcasts around 2000  
in press - several interviews - recent Forbes (Polish Edition) Sep.2020

## Selected publications 2018-2019:

(posters and presentations available at <https://www.qwed.eu/mmama.html>):

- [1] M. Celuch, J. Rudnicki, J. Krupka, W. Gwarek, "[Application of dielectric resonators to surface impedance measurements of microwave susceptors](#)", 17th International Conference on Microwave and High Frequency Heating AMPERE 2019, Valencia, 9-12 September 2019.
- [2] M. Celuch, "[Why set up a modelling SME when you are student? - the economic impact of QuickWave software](#)" and M. Celuch, M. Olszewska-Placha, "[QuickWave conformal FDTD modelling: electromagnetics and beyond](#)", *EMMC-CSA Workshop on Industrial Impact of Materials Modelling*, Turin 8-10 July 2019.
- [3] M. Celuch, W. Gwarek, A. Wieckowski, "[Enhanced-resolution material imaging with dielectric resonators: a new implicit space - domain technique](#)", *IEEE MTT-S International Microwave Symposium 2019*, Boston, 2-7 June 2019, pp. 55-58.
- [4] M. Celuch, M. Olszewska-Placha, K. Wilczynski, "Macroscopic models of thin conductive layers: systematic Evaluation for microwave heating and shielding applications", *IEEE MTT-S International Microwave Symposium 2019*, Boston, 2-7 June 2019, pp. 47-50.
- [5] M. Celuch, W. Gwarek, A. Wieckowski, "[Modelling-based methodology fo downscaling dielectric resonator material measurements of material surfaces](#)", *IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization NEMO 2019*, Cambridge, 29-31 May 2019.
- [6] A. Can Gungor, M. Celuch, J. Smajic, M. Olszewska-Placha, Juerg Leuthold "[Flexible Electromagnetic Modeling of SMM Setups with FE and FDTD Methods](#)", *IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization NEMO 2019*, Cambridge, 29-31 May 2019.
- [7] M. Olszewska-Placha, C. Granet, M. Celuch, M Sypniewski, "[Efficient Implementation of BOR FDTD Algorithms in the Engineering Design of Reflector Antennas](#)", *13<sup>th</sup> European Conference on Antennas and Propagation*, March 31-April 4, 2019, Krakow, Poland.
- [8] W. Gwarek, M. Celuch, M. Olszewska-Placha, "[Advanced modelling-based methodology for evaluation and design of large reflector antennas for space applications - state-of-the-art and collaborative research perspective](#)", *39<sup>th</sup> ESA Antenna Workshop of Multibeam and Reconfigurable Antennas for Space Applications Proceedings*, 2-4 October 2018, ESTEC, Noordwijk, The Netherlands.
- [9] M. Celuch, W. Gwarek, "[Accurate Analysis of Whispering Gallery Modes in Dielectric Resonators with BoR FDTD Method](#)", *22<sup>nd</sup> International Microwave and Radar Conference MIKON 2018*, 15-17 May 2018, Poznan, Poland.