

# TECHNOLOGICAL EDUCATIONAL INSTITUTE OF WESTERN MACEDONIA (TEIWM)

## CURRICULUM VITAE

**Name:** Nikolaos POULAKIS

**School** of Applied Science

**Department:** Electrical Engineering

### Contact information

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### 1. DEGREES

B.Sc. in Physics (1988), National and Kapodistrian University of Athens, Greece

Ph.D. Electrical in Physics (1997), National Technical University of Athens, Greece

#### Title of Thesis

A Raman study of the YBCO high temperature superconductor  
(Thesis URL: <http://thesis.ekt.gr/8859> )

### 2. MAJOR FIELDS OF SCHOLARLY AND RESEARCH INTERESTS

Eddy current magnetic field measurements

Non-destructive testing

High temperature SQUID applications

Test and measurement systems automation

Smart power grid monitoring and control applications

Optical (Raman, ellipsometry) and NMR spectroscopies

Thin film growth with PVD techniques: Sputtering, Ion beam, PLD

### 3. PAST AND CURRENT NATIONAL AND INTERNATIONAL RESEARCH COLLABORATIONS

Dr. Poulakis' research collaborations are chronologically divided in two periods, following his research interests.

(a) 1994 – 2001, Physics of High Temperature Superconductivity

- Collaboration with Prof. E. Kaldis ETH, Zurich and Dr. K.A. Muller at IBM Zurich Research Laboratory. In this period, Dr. Poulakis is a coauthor in four publications with K.A. Müller, Nobel Prize in Physics in 1987 for the discovery of high temperature superconductors.
- Collaboration with the research group of Prof. M. Iliev, Bulgarian Academy of Sciences, Sofia.

(b) 2003 – Present, eddy current non-destructive testing measurements with emphasis on the use of HTS SQUID magnetometers.

- Prof. Th. Theodoulidis, Univ. Western Macedonia, Kozani, Greece.
- Collaboration with Prof. J.R. Bowler, Center for Nondestructive Evaluation (CNDE), Iowa State University, USA.
- Collaboration with the research group of G.Y. Tian, University of Newcastle, U.K.
- Collaboration with Prof. A. Tambourrino, Univ. of Cassino, Italy

Dr. Poulakis is a member of [MEANDER](#) group, a center of research in the field of eddy current nondestructive evaluation and founder of the experimental branch of the group.

#### **4. FELLOWSHIPS**

- 1991, National Center for Scientific Research “Demokritos”, 4-year fellowship for the Institute of Materials Science (Superconductivity and Magnetic Oxides Laboratory), Athens, Greece
- 2005, General Secretariat for Research and Technology, 2-year research grant in the framework of Programme for the Enhancement of Research Manpower (PENED)
- 1999, Marie Curie Intra-European Fellowship (IEF), 2-year individual postdoctoral research grant for the Centre National de la Recherche Scientifique (CNRS), Grenoble, France.

#### **5. RESEARCH AND TEACHING POSITIONS PRIOR TO APPOINTMENT AT TEIWM**

- 1998, Postdoctoral Researcher, Technical University of Athens (NTUA), Greece
- 1999-2000, Chercheur, Centre National de la Recherche Scientifique (CNRS), Grenoble, France
- 2001-2002, Postdoctoral Researcher, Aristotle University of Thessaloniki (AUTH), Greece
- 2002-2003, Teaching Assistant (Physics), TEI of Western Macedonia

## 6. APPOINTMENTS AT TEIWM – ELECTRICAL ENGINEERING DEPARTEMENT

### (a) Academic

2003-2009, Assistant Professor

2009-present, Associate Professor

### (b) Administrative positions carrying stipend and/or release time

2004 September 1 – 2005 August 31, Head of the ECT (Electronics, Control & Telecommunications) sector the Electrical Engineering Department

2010 September 1 – 2013 August 31, Head of Electrical Engineering Department

## 7. TEACHING ASSIGNMENTS

2001 – Present, Dr. Poulakis has been assigned to give theoretical lectures and supervise lab exercises in the following Electrical Eng. Department's modules

Physics (EE148)

Electromagnetics (EE168)

Electrotechnics (circuit analysis) (EE108)

Electronics (EE113)

Measurement systems (sensor technology) (EE159)

SCADA systems (EE100)

Lecture notes and laboratory exercises practical notes for the modules above are accessible via TEIWM's open e-class platform, <http://eclass.teiwm.gr> (simply sign-in as a user)

## 8. PUBLICATIONS

2004 – present: 17 refereed journal publications

17 refereed conference publications,

1 contribution to books series.

Times cited without self-citations: 293

Citing articles without self-citations: 245

h-index: 7

Source: WEB OF SCIENCE™ (see a complete publication-citation report [here](#))

### (a) Refereed Journal Publications

1. John Martinos, Theodoros Theodoulidis, Nikolaos Poulakis, and Antonello Tamburrino, "A Benchmark Problem for Eddy Current Nondestructive Evaluation", *IEEE Trans. on Magnetics*, vol. 50, no. 2, Feb. 2014.

2. Roberto Miorelli, Christophe Reboud, Theodoros Theodoulidis, John Martinos, Nikolaos Poulakis, Dominique Lesselier, "Coupled approach VIM–BEM for efficient modeling of ECT signal due to narrow cracks and volumetric flaws in planar layered media", *NDT&E International*, vol. 62, pp. 178-183, 2014.
3. Roberto Miorelli, Christophe Reboud, Theodoros Theodoulidis, Nikolaos Poulakis, and Dominique Lesselier, "Efficient Modeling of ECT Signals for Realistic Cracks in Layered Half-Space", *IEEE Trans. on Magnetics*, vol. 49, no. 6, Jun. 2013.
4. Charitini Voulgaraki, Nikolaos Poulakis, and Theodoros Theodoulidis, "Theoretical Simulations and Quantitative Magnetic Field Measurements for Eddy-Current Testing with an HTS SQUID System", *IEEE Trans. on Applied Superconductivity*, vol. 23, no. 4, Aug. 2013.
5. John R. Bowler, Theodoros P. Theodoulidis, and Nikolaos Poulakis, "Eddy Current Probe Signals Due to a Crack at a Right-Angled Corner", *IEEE Trans. on Magnetics*, vol. 48, no. 12, Dec. 2012.
6. Anthony Simm, Theodoros Theodoulidis, Nikolaos Poulakis, and Gui Yun Tian, "Investigation of the magnetic field response from eddy current inspection of defects", *Int. J. Adv. Manuf. Technol.*, vol. 54, pp. 223–230, 2011.
7. Theodoros Theodoulidis, Nikolaos Poulakis, Athanasios Dragogias, "Rapid computation of eddy current signals from narrow cracks", *NDT&E International*, vol. 43, pp. 13–19, 2010.
8. A. Laskarakis, M. Gioti, E. Pavlopoulou, N. Poulakis, S. Logothetidis, "A Spectroscopic Ellipsometry Study of PET Membranes from IR to Vis-UV", *Macromol. Symp.*, vol. 205, pp. 95-104, 2004.
9. N. Poulakis, D. Lampakis, E. Liarokapis, Akira Yoshikawa, Jun-ich Shimoyama, Kohji Kishio, G. B. Peacock, J. P. Hodges, I. Gameson, P. P. Edwards, and C. Panagopoulos, "Re-induced Raman active modes in  $\text{HgBa}_2\text{Ca}_{n-1}\text{Cu}_n\text{O}_{2n+2+d}$  compounds", *Phys. Rev. B*, vol. 60, no. 5, pp. 3244-3251, Aug. 1999.
10. E. Kaldis, J. Röhrler, E. Liarokapis, N. Poulakis, K. Conder, and P. W. Loeffen, "A Displacive Structural Transformation in the  $\text{CuO}_2$  Planes of  $\text{YBa}_2\text{Cu}_3\text{O}_x$ ", *Phys. Rev. Lett.*, vol. 79, no. 24, pp. 4894-4897, Dec. 1997.
11. D. Palles, N. Poulakis, E. Liarokapis, A. Gantis, M. Calamiotou, and A. Koufoudakis, "Raman spectroscopic study of the  $\text{La}_{0.5}\text{R}_{0.5}\text{Ba}_2\text{Cu}_3\text{O}_y$  ( $R = \text{Y}$ , rare earth) superconductors", *Superlattices and Microstructures*, vol. 21, no. 3, pp. 329-334, 1997.
12. V. Psycharis, C. Mitros, A. Koufoudakis, H. Gamari-Seale, D. Niarchos, N. Kalitsounakis, N. Poulakis, D. Palles, and E. Liarokapis, "Structural study, resistivity, magnetization and Raman measurements for the  $\text{HT}_c$  superconducting compounds  $\text{SmBa}_{2-x}\text{Sr}_x\text{Cu}_3\text{O}_{6+y}$  ( $x = 0.0, 0.25, 0.5, 0.75, 1.0$  and  $1.25$ )", *Physica C*, vol. 267, pp. 211-224, 1996.

13. D. Palles, N. Poulakis, E. Liarokapis, K. Conder, E. Kaldis, and K. A. Müller, "Raman study of the oxygen anharmonicity in  $\text{YBa}_2\text{Cu}_3\text{O}_x$  ( $6.4 < x < 7.0$ ) superconductors", *Phys. Rev. B*, vol. 54, no. 9, pp. 6721-6727, Sept. 1996.
14. N. Poulakis, D. Palles, E. Liarokapis, K. Conder, E. Kaldis, and K. A. Müller, "Phase separation and softening of the O<sub>2,3</sub> in-phase mode in the  $\text{YBa}_2\text{Cu}_3\text{O}_x$  superconductors", *Phys. Rev. B*, vol. 53, no. 2, pp. R534-R537, Jan. 1996.
15. M. Pissas, G. Kallias, N. Poulakis, D. Niarchos, and A. Simopoulos, "Structural, Mossbauer and Raman studies of the  $(\text{Y,Ce})_2\text{Sr}_2\text{Cu}_2\text{FeO}_{8+y}$  compound", *Phys. Rev. B*, vol. 52, no. 14, pp. 10610-10620, Oct. 1995.
16. D. Zech, H. Keller, K. Conder, E. Kaldis, E. Liarokapis, N. Poulakis & K. A. Müller, "Site-selective oxygen isotope effect in optimally doped  $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ ", *Nature*, vol. 371, pp. 681-683, Oct. 1994.
17. G. Bogachev, M. Abrashev, M. Iliev, N. Poulakis, E. Liarokapis, C. Mitros, A. Koufoudakis, and V. Psyharis, "Raman study of  $\text{R}_{0.5}\text{Pr}_{0.5}\text{Ba}_2\text{Cu}_3\text{O}_{7-\delta}$  (R = Y, rare earth)", *Phys. Rev. B*, vol. 49, no. 17, pp. 12151-12158, May 1994.

#### **(b) Contributions to Books Series**

1. E. Kaldis, E. Liarokapis, N. Poulakis, D. Palles, and K. Conder, "A Refined Picture of the  $\text{YBa}_2\text{Cu}_3\text{O}_x$  Structure: Sequence of Dimpling-Chain Superstructures, 1D-Modulation of the Planes, Phase Separation Phenomena", in *Stripes and Related Phenomena*, edited by Bianconi and Saini, Kluwer Academic/Plenum Publishers, New York, 2000.

#### **(c) Refereed Conference Publications**

1. C. Voulgaraki, N. Poulakis, and T. Theodoulidis, "Theoretical and experimental investigation of a SQUID system for the nondestructive inspection of rivet holes", in *the 18<sup>th</sup> International Workshop on Electromagnetic Nondestructive Evaluation (ENDE 2013)*, 25 – 28 June 2013, Bratislava, Slovak Republic.
2. N. Poulakis, C. Voulgaraki, and T. Theodoulidis, "Modular Instrument for Eddy Current Testing with Magnetic Field Sensors", in *Review of Progress in Quantitative NDE (QNDE 2013)*, July 21 – 26, 2013, Baltimore, Maryland, USA.
3. C. Voulgaraki, N. Poulakis, and T. Theodoulidis, "Study of the SQUID Technique in Eddy Current Inspection of Fastener Hole Cracks", in *5<sup>th</sup> International Conference on NDT of HSNT*, May 2013, Athens, Greece.
4. C. Voulgaraki, N. Poulakis, and T. Theodoulidis, "Quantitative SQUID Measurements for Eddy Current NDI of Fastener Hole Cracks", in *4th International Symposium on NDT in Aerospace 2012*, Nov 13-14, Augsburg, Germany, published in the e-Journal of Nondestructive Testing, NDTnet, vol.18 no.02, Feb. 2013 (<http://www.ndt.net/article/aero2012/papers/tu2b1.pdf>).

5. T. P. Theodoulidis, J. Martinos, and N. Poulakis, "Numerical results for the WFNDEC 2012 eddy current benchmark problem", in *Review of Progress in Quantitative NDE (QNDE 2012)*, July 15 – 20, 2012, Denver, Colorado, USA.
6. Roberto Miorelli, Christophe Reboud, Dominique Lesselier, Nikolaos Poulakis, Theodoros Theodoulidis, "ECT Simulation of Complex Narrow Cracks in Planar Multi-Layered Structures", in the 17th International Workshop on Electromagnetic Nondestructive Evaluation (ENDE), July 2012, Rio de Janeiro, Brazil, published in *Studies in Applied Electromagnetics and Mechanics*, vol. 38: Electromagnetic Nondestructive Evaluation (XVI), IOS Press, pp. 103-110, 2014.
7. D. Stimoniaris, D. Tsiamitros, N. Poulakis, T. Kottas, V. Kikis, and E. Dialynas, "Investigation of Smart Grid Topologies Using Pilot Installations Experimental Results", in the 2nd IEEE PES International Conference and Exhibition on Innovative Smart Grid Technologies (ISGT Europe), 5-7 Dec. 2011, Manchester, GB.
8. Theodoros P. Theodoulidis, Nikolaos Poulakis, John R. Bowler, "Evaluation of Eddy Current Probe Signals Due to Interaction with Edge Cracks", in The 13th International Workshop on Electromagnetic Nondestructive Evaluation (ENDE), June 2008, Seoul Education and Culture Center, Korea, published in *Studies in Applied Electromagnetics and Mechanics*, vol. 33: Electromagnetic Nondestructive Evaluation (XII), IOS Press, pp. 9-17, 2010.
9. Theodoros Theodoulidis, Nikolaos Poulakis, John Bowler, "Developments in modelling eddy current coil interactions with a right-angled conductive wedge", in *The 11<sup>th</sup> International Workshop on Electromagnetic Nondestructive Evaluation (ENDE 2013)*, 14 – 16 June 2006, Iwate, Japan, published in *Studies in Applied Electromagnetics and Mechanics*, vol. 28: Electromagnetic Nondestructive Evaluation (X), IOS Press, pp. 41-48, 2007.
10. Nikolaos Poulakis, Theodoros Theodoulidis, "Quantitative magnetic field measurements in the nano-Tesla region for eddy current NDE", in *Review of Progress in Quantitative NDE (QNDE 2006)*, July 30 – August 4, 2006, Portland, USA (<http://www.qndepgrams.org/2006/2006%20Abstract%20Book.pdf>).
11. D. Palles, N. Poulakis, E. Liarokapis, K. Conder, and E. Kaldis, "Phase transitions at low oxygen concentration in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>x</sub>", in *Materials and Mechanisms of Superconductivity High Temperature Superconductors VI*, 20–25 February 2000, Houston, Texas, USA, published in *Physica C*, vol. 341-348, pp. 2163-2164, 2000.
12. N. Poulakis, K. Conder, E. Kaldis, and Y. Berthier, "Study of the chain oxygen order in underdoped YBa<sub>2</sub>Cl<sub>3</sub>O<sub>6.44</sub> by means of NQR investigation of Cu(1)", in *Materials and Mechanisms of Superconductivity High Temperature Superconductors VI*, 20–25 February 2000, Houston, Texas, USA, published in *Physica C*, vol. 341-348, pp. 2001-2002, 2000.
13. R. Vlastou, E.N. Gazis, C.T. Papadopoulos, E. Liarocapis, D. Palles, N. Poulakis, S. Kossionides, M. Kokkoris, G. Kaliabakos, W. Assmann, and P. Berbeich,

- “Radiation damage of  $\text{YBa}_2\text{Cu}_3\text{O}_7$  superconductors”, in *13th International Conference on Ion Beam Analysis (IBA-13)*, 27 July–1 August 1997, Lisbon, Portugal, published in *Nuclear Instruments and Methods in Physics Research B: Beam Interactions with Materials and Atoms*, vol. 136-138, pp. 1286-1290, 1998.
14. M. Holiastou, N. Poulakis, D. Palles, E. Liarokapis, D. Niarchos, U. Frey, and H. Adrian, “XRD and micro Raman characterization of epitaxial Bi-2201, Bi-2212 and Bi-2223 thin films”, in *Materials and Mechanisms of Superconductivity High Temperature Superconductors V*, 28 February – 4 March 1997, Beijing, China, published in *Physica C*, vol. 282-287, pp. 583-584, 1997.
  15. D. Palles, D. Lampakis, N. Poulakis, K. Conder, E. Kaldis, and E. Liarokapis, “Low temperature Raman study of the  $\text{YBa}_2\text{Cu}_3\text{O}_x$  ( $6.44 < x < 6.98$ ) superconductor”, in *Materials and Mechanisms of Superconductivity High Temperature Superconductors V*, 28 February – 4 March 1997, Beijing, China, published in *Physica C*, vol. 282-287, pp. 1051-1052, 1997.
  16. E. Liarokapis, N. Poulakis, D. Palles, K. Conder, E. Kaldis, and K.A. Müller, “Raman study of the oxygen vibrations in 123-superconductors”, in *Phonons 95*, 23–28 July 1995, Sapporo, Japan, published in *Physica B*, vol. 219-220, pp. 139-141, 1996.
  17. G. G. Bogachev, N. Poulakis, V. G. Hadjiev, E. Liarokapis, H. Gamari-Seale, D. Niarchos, and M. N. Iliev, “St-Substitution-Dependent Mixing of the (Ba,Sr)-Ag and Cu2-Ag Phonons in  $\text{NdBa}_{2-x}\text{Sr}_x\text{Cu}_3\text{O}_{7-\delta}$  ( $0 \leq x \leq 1.1$ )”, in *Materials and Mechanisms of Superconductivity High Temperature Superconductors IV*, 5 – 9 July 1994, Grenoble, France, published in *Physica C*, vol. 235-240, no.2, pp. 1187-1188, 1994.
  18. D. Palles, N. Poulakis, Th. Leventouri, and E. Liarokapis, “The Ca substitution for Y and Ba in the  $\text{YBa}_2\text{Cu}_3\text{O}_y$  superconductor: a Raman study”, in *Materials and Mechanisms of Superconductivity High Temperature Superconductors IV*, 5 – 9 July 1994, Grenoble, France, published in *Physica C*, vol. 235-240, no.2, pp. 1179-1180, 1994.
  19. N. Poulakis, D. Palles, C. Mitros, V. Psycharis, A. Koufoudakis, D. Niarchos, and E. Liarokapis, “Changes induced in the Raman spectra of  $\text{SmB}_{2-x}\text{Sr}_x\text{Cu}_3\text{O}_y$ , the redistribution of carriers and the orthorhombic-to-tetragonal phase transition”, in *Materials and Mechanisms of Superconductivity High Temperature Superconductors IV*, 5 – 9 July 1994, Grenoble, France, published in *Physica C*, vol. 235-240, no.2, pp. 1177-1178, 1994.

**(d) Other publication works**

Translation in Greek of D. Nesculescu’s “Mechatronics”, Tziola Scientific Publications, 2011.

**9. STUDENT SUPERVISION**

**(a) PhD Students**

Dr. Poulakis is currently co-supervising one thesis<sup>1</sup> (X. Voulagraki, M.Eng., Univ. of W. Macedonia, see “Publications”)

**(b) Undergraduates**

Dr. Poulakis has supervised 15 students’ diploma dissertations (see [TEIWM Library Catalog](#))

**10. MEMBERSHIPS IN PROFESSIONAL SOCIETIES**

1. Member, IEEE, 2012

**11. GRANTS AND FUNDING FROM ALL AGENCIES**

Participation as a co-investigator in 7 research projects from European and National (General Secretary for Research and Technology) funding agencies.  
Principal investigator (coordinator) in one research project.

**12. JOURNAL REVIEWER**

Dr. Poulakis has served as a reviewer for the following journals

NDT&E International

Measurement Science and Technology

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<sup>1</sup> Note: According to Greek legislation for the Higher Education Institutions, professors from Technological Educational Institutions can only serve as members in a PhD supervising committee (not as principal supervisors)