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IOANNIS P. ANTONIADES

- Place of birth/residence: Thessaloniki
- Current position: Adjunct professor at Department of Applied & Environmental Physics, School of Physics, Aristotle University of Thessaloniki, Greece.

A. STUDIES

1. 1993 - 1999 *Aristotle University of Thessaloniki, Physics dept.*
PhD thesis

- Title: "*Monte Carlo methods and their application to crystal lattices and grain boundaries*" (Computational physics – condensed matter physics.)

2. 1988 - 1992 *University of Chicago*, USA.
BA Physics

- GPA **3,515**/4. **Full-tuition scholarship**

3. 1982 - 1988   Anatolia College, Thessaloniki. **Full-tuition scholarship.**

B. POSITIONS HELD

2021- : Adjunct professor at Department of Applied & Environmental Physics, School of Physics, Aristotle University of Thessaloniki. Courses taught: Electric Circuits Laboratory, Non-linear Electrical Circuits Laboratory.

2007-2008 and 2010-2021 : Physics instructor at Technical Lykeion of Kalamaria.

2016-: Physics instructor at American College of Thessaloniki. I designed and teach a freshman year College course: Physics 120 for Science & Engineering to "study abroad" students of NorthEastern University, Boston.

2001 -2007 Temporary lecturer (ΠΔ 407/80), *Department of*

Informatics, Aristotle University of Thessaloniki. Subjects taught:
- *"theoretical informatics", 3 semesters*
- *"Structured programming", 6 semesters*
- *"Linear Algebra", 4 semesters*
- *"Microsystems (MEMS)" (graduate course) 2 semesters*
- *"Novel computational technologies (Quantum computing)" 2 semesters*

B3: *2005- 2009* **Laboratory lecturer,** *Department of Informatics, Alexander Technological Educational Institute of Thessaloniki*. Subjects taught:
- «Computational methods and scientific computing» 8 semesters
- «Object-oriented programming» (JAVA). (2 semesters)

B4: **2001-2007:** Project management and technical management of funded EU and national research/demonstration projects.

B5. **2008-2010:** International University of Thessaloniki, administrative officer.

B6. **2001-2007**: Free-lance profession at development of specialized software.

C. PROFESSIONAL EXPERIENCE IN COMPUTERS

- JAVA, advanced programming in MATLAB/SIMULINK.
- ASP, VBscript, JavaScript, JSP
- C, FORTRAN.

D. MANAGEMENT & PARTICIPATION IN RTD, DEMONSTRATION EDUCATIONAL PROJECTS

1993 - 2008: I participated in a total of 30 funded RTD, demostration, educational/training projects.

	Number of projects	Budget/Funding source
Categorization based on type of employment:		
Project coordination/ technical management	2	1.725.000 €/ 1 (EU-FP5/ECONTENT), 1 GSRT(Greece)-EUREKA
Workpackage Leader	3	2.528.334 (2 EU/FP6/IST, 1 EU/SOCRATES-

		MINERVA)
Researcher/ member of technical team	**25**	
Categorization based on funding source:		
International/EU	**10**	3 IST, 1 ECONTENT, 1 TEMPUS-PHARE, 1 SOCRATES-MINERVA, 3 ERASMUS
National	**22**	

E. RESEARCH EXPERIENCE

- *Theoretical Statistical mechanics & applications, Complex systems .*
  Application areas:
    o Chaotic systems for secure communications

    o Memristive systems & smart alloys (NiTi)

    o Electronics, nano-electronics

    o Econophysics (macroeconomic system):

    o Modeling of Social systems

    o Alloys and Ternary (Fibrous) semiconductors

  Methods & Tools:
    o Physical modeling via systems of ODEs
    o Event-based dynamic simulation and behavioral modeling:
    o Non-linear analysis (multi-fractal analysis,Husts exponents and other non-linear metrics, PCA analysis etc.)
    o Complex network time series analysis: C**Error! Reference source not found.**.
    o Non-extensive statistics (Tsallis statistics)

- *Atomistic simulations/Analytical calculations in solid state physics*
  Application areas:
    o Grain boundaries in alloys (Cu_3Au)

- o   Free surfaces and amorphous/crystal Silicon interfaces

Methods:
- o   *Monte Carlo, simulated annealing with many-body pseudo-potentials*
- o   *Molecular Dynamics and variations (Nose-Hoover thermostat) with many-body pseudopotentials*
- o   *Mean-field analytical calculations*:

Reservoir Computing (Echo-State Networks/Neural Networkstime series forecasting

G. SCHOLARSHIPS/AWARDS

- Paper & poster presented at the international conference on "Intergranular and Interface Boundaries in materials" (Lisbon 1995) was among the **11** posters that received a prize out of the **275** presented.
- My PhD dissertation was supported by a Scholarship issued by the **State Scholarship Foundation (IKY)** (1996-2000).
- Full-tuition scholarship for my undergraduate studies at the **University of Chicago** (1988 - 1992).
- Full-tuition scholarship for my studies at **Anatolia College** (1982-1988).

I. SCIENTIFIC PUBLICATIONS

I1. *Intenational Journals*

I1. "A Novel Simulation Model for the Development Process of Open Source Software Projects", I. P. Antoniades, I. Stamelos, L. Angelis and G. L. Bleris, International Journal of Software Process: Improvement and Practise (SPIP), special issue on Software Process simulation and modelling, **7**(3-4), pp. 173-188 (2003).

I2. "Mean-field analytical calculation of segregation profile around grain boundaries and free surfaces in binary alloys", I. P. Antoniades and G. L. Bleris, Phil. Mag. A, **80**, pp. 2871-2897 (2000).

I3. "Monte Carlo and Molecular Dynamics Investigation of [001] Twist Boundaries in Cu_3Au at T=0K", A. J. Patrinos, I. P. Antoniades and G. L. Bleris, Phys. Rev. B, **52**, 13, pp. 9291-9299 (1995).

I4. "Secure communication by chaotic synchronization: robustness under noisy conditions", *A. Miliou, I. P. Antoniades, S. Stavrinidis and A. N. Anagnostopoulos,* Nonlinear Analysis Series B: real World Applications, **8**(3), pp. 1003-1012 (2007).

I5. "Mean-field analytical calculation of the segregation profile around grain boundaries in $L1_2$ alloys", I. P. Antoniades and G. L. Bleris, Materials Science Forum, **294-296**, pp. 493-496 (1999), also presented in *Intergranular and Interface Boundaries '98 (iib'98),*

Prague, Czech Rep. 1998.

I6. "Molecular Dynamics Investigation of the Σ5 Energy Cusp in [001] Twist Grain Boundaries in Cu₃Au at T=0 K", I .P. Antoniades, A. J. Patrinos, and G. L. Bleris, Materials Science Forum, 207-209, pp. 833-836 (1996), also presented in *Intergranular and Interface Boundaries '95 (iib'95)*, Lisbon, Portugal 1995.

I7. "A theoretical model for the non-linear behavior of fibrous semi-conductors", I. P. Antoniades, A.J. Patrinos, A. Anagnostopoulos, G.L. Bleris and A. Cenys, Advances in Synergetics, **9**, pp. 29-46 (1997).

I8. "Using neural nets for eliminating noise in experimental signals", George Karatasios, Ioannis P. Antoniades, Eleni Fournou and Panos Argyrakis, Applied Mathematical Sciences, **1**(19), pp. 915 – 929 (2007).

I9. "Crystallization of Amorphous Silicon Thin Films: Comparison Between Experimental and Computer Simulation Results", J. Kioseoglou, Ph. Komninou, G. P. Dimitrakopulos, I. P. Antoniades, M.K. Hatalis and Th. Karakostas, *accepted* for publication in Materials Science Forum, also presented in *Intergranular and Interface Boundaries '07* (iib'07), Barcelona, Spain, July 2007.

I10. "The nonlinear current behaviour of a driven R-L-Varactor in the low frequency range", J. Kalomiros, S.G. Stavrinides, A.N Miliou, I.P. Antoniades, L. Magafas, A.N. Anagnostopoulos, Nonlinear Analysis: Real World Applications, 10(2), pp. 691-701, 2009.

I11. "A chaotic communication system with enhanced security features", I.P. Antoniades, A.N Miliou, S.G. Stavrinides, A.N. Anagnostopoulos, Journal of Applied Functional Analysis, 4(2), pp. 237-248, 2009.

I12. "NiTi memristive behavior",
S.G. Stavrinides, **I. P. Antoniades**, J. Georgiou, E. Hatzikraniotis, Microelectronic Engineering , 216, 111026 (2019).

I13. "Tsallis non-extensive statistics and multifractal analysis of nanoscale fully-depleted MOSFET current dynamics",
I. P. Antoniades, G. Marinos, L.P. Karakatsanis, E.G. Pavlos, S.G. Stavrinides, D. Tassis, G.P. Pavlos, Physica A: Statistical Mechnics& its Applications, 533, 121820 (2019).

I14. "The use of scaling properties to detect relevant changes in financial time series: a new visual warning tool",
I. P. Antoniades, G. Brandi, L.G. Magafas, T. Di Matteo, Physica A: Statistical Mechanics & its Applications,**565**, 125561 (2021),DOI:*https://doi.org/10.1016/j.physa.2020.125561*.

I15. "Dynamical Characteristics of Global Stock Markets Based on Time Dependent Tsallis Non-Extensive Statistics and Generalized Hurst Exponents",
I. P. Antoniades, L.P. Karakatsanis, E.G. Pavlos, Physica A: Statistical Mechanics & its Applications,**578**, 126121 (2021), DOI: https://doi.org/10.1016/j.physa.2021.126121.

I16. "Reservoir Computing vs. Neural Networks in Financial

forecasting",

S. P. Georgopoulos, P. Tziatzios, S. G. Stavrinides, **I. P. Antoniades**, M. H. Hanias, <u>Int. J. Computational Economics and Econometrics</u> (2021), *in press*.

I2. *Book chapter*

I17. «Dynamical simulation models of the Open Source Development process», I. P. Antoniades, I. Samoladas, I. Stamelos, L. Angelis and G. L. Bleris, in <u>Free/Open Source Software Development</u>, Idea Group Inc., PA, USA (2003), p. 174-202.

I3. *International conferences*

I18. "Resource arbitration using Neural Networks", <u>Vasilios G. Chouvardas</u>, Ioannis P. Antoniades, Miltiades K. Hatalis, Georgios L. Bleris. *Traditional Mathematics and Mechanics* 2004, Messini, Greece 24-28 May, 2004, Eds. G. C. Sih and C. P. Spyropoulos.

I19. "Quantum Cryptography: A short historical overview and recent developments", <u>I. P. Antoniades</u>, V. G. Chouvardas, M. K. Hatalis and G. L. Bleris, *Traditional Mathematics and Mechanics* 2004, Messini, Greece 24-28 May, 2004, Eds. G. C. Sih and C. P. Spyropoulos.

I20. "The Effect of Noise and Parameter Mismatch on the Synchronization of a Drive-Response Chaotic System", Ioannis P. Antoniades, Amalia N. Miliou, Stavros G. Stavrinides and Antonios N. Anagnostopoulos, *Chaos and Complex Systems*, Istanbul, Turkey 12-14 May 2006.

I21. "Simulation of the temporal evolution of OSS projects: application to XMMS and MPLAYER", I. P. Antoniades, M. Kontoyiannis, I. Stamelos, I. Deligiannis, Workshop On Public Data about Software Development (WOPDaSD 2007) organized under OSS 2007 international conference, Limerick, Ireland, June 2007.

I22. "A chaotic communication system with enhanced security features" I.P. Antoniades, A.N Miliou, S.G. Stavrinides, A.N. Anagnostopoulos. , In Proc. CCS-2008, May 2008, Constantinople, Turkey.

I23. An Intelligent System for Monitoring and Predicting Water Quality,
Nick Bassiliades, **I. P. Antoniades**, E. Hatzikos, I. Vlahavas, G. Koutitas,
European conference of the Czech Presidency of the Council of the EU, TOWARDS Eenvironment, Opportunities of SEIS and SISE: Integrating Environmental Knowledge in Europe, J. Hřebíček*et al.*(eds.), MasarykUniversity, 2009.

I24. Complex Network Timeseries Analysis of a model macro-economic system",
I. P. Antoniades, S.G. Stavrinides, and M.P. Hanias, in *Chaos & Complex System*s, Springer Proceeding in Complexity, Stavrinides, Stavros G., Ozer, Mehmet (Eds.), DOI 10.1007/978-3-030-35441-1,

Springer, Proceedings of 5th International Conference on Chaos & Complex Systems (CCS2019), Antalya, Turkey, 9-12 May, pp. 135-147.

I25. A simulation model for smart alloy NiTi memristive behavior
I. P. Antoniades, S.G. Stavrinides, J. Georgiou,E. Hatzikraniotis,
International Conference on Memristive Materials, Devices & Systems (MEMRISYS_2019), Dresden, Germany, 8-11 July 2019.

I26. A warning tool for financial time-series based on time dependent Generalized Hurst exponents,
I. P. Antoniades, G. Brandi, L. Magafas and T. Di Matteo, CCS2020, December 7-11, 2020.

I27. Discrete Event Simulation of an automated warehouse inspection system with drones
I. P. Antoniades, I. Stamelos, Proceedings of the 13th International Conference on Information, Intelligence, Systems and Applications (IISA2022), Corfu, 18-20 July, 2022, IEEExPlore special issue (*to appear*).

I28. Forecasting Daily Foreign Exchange Market Trends Using Long-Short Term Memory Artificial Neural Network with Multiple Fourier Transform Pre-processing
K. Karampas, I. P. Antoniades, C.K. Volos and I.N. Stouboulos, Econophysics Colloquium 2022, Thessaloniki, 24-26 August 2022.

I29. Reservoir computing and Echo-State networks in Time-Series prediction: better than artificial-neural networks?
I. P. Antoniades, C.K. Volos and I.N. Stouboulos, 2022 online Conference on Nonlinear Science and Complexity, Thessaloniki, Scool of Physics, 26-29 Sept. 2022.

I4. *Hellenic and regional conferences*

I30. "Dynamical simulation models of the Open Source Development process", I. Antoniades, I. Stamelos, L. Angelis and G. L. Bleris, 9th Panhellenic Conference in Informatics, Thessaloniki, Nov. 2003.

I31. "Quantum Cryptography: The Ultimate Solution to Secure Data Transmission?", I. P. Antoniades, A. Miliou and M.K. Hatalis, Proceedings of the 2nd Balkan Conference in Informatics, Ohrid, November 2005.

I32. «Μετάβαση Τάξης-Αταξίας σε δικρύσταλλο Cu_3Au γύρω από Επιφάνεια Επαφής Στροφής Σ5», Γ. Π. Αντωνιάδης, Γ. Λ. Μπλέρης, *Πρακτικά XIII Πανελληνίου Συνεδρίου Φυσικής Στερεάς Καταστάσεως*, Θεσσαλονίκη, Σεπτέμβριος 1997.

I33. "Η ενεργειακή ανωμαλία γύρω από την [001] Επιφάνεια Επαφής Στροφής Σ5 σε Cu_3Au και τα πεδία μετατοπίσεων των εξισορροπημένων δομών των γειτονικών στην Σ5 επιφανειών", I. P. Antoniades, A. J. Patrinos and G.L. Bleris, *Πρακτικά XI Πανελληνίου Συνεδρίου Φυσικής Στερεάς Καταστάσεως*, Ξάνθη, Σεπτέμβριος 1995.

I34. "The energy and structure of the Σ5 and near Σ5 [001] twist boundaries in Cu_3Au: a molecular dynamics investigation", I. P.

Antoniades, A. J. Patrinos and G.L. Bleris, *proceedings of the 16th Greek Bulgarian Symposium on semiconductor Physics*, Thesaloniki, October 16-20, 1995.

I35. "On the Success of ERP Systems: a Comparative Study between Open Source and Commercial Systems", L. Chatzithomas, I. Stamelos I., I. P. Antoniades, I. Fotiadis, Proceedings of the 4th Balkan Conference in Informatics (BCI2009), Thessaloniki, 2009.

I5. *Translation (English to Greek)*

I36. S. Lipschutz, Linear Algebra, 3rd editions, Schaum Outline Series, McGraw Hill Companies Inc. (2001), Greek Edition: Τζιόλας ΟΕ, Thessaloniki (2002).