

**Technological Educational Institute of Piraeus
Department of Physics, Chemistry & Materials Technology**

Curriculum Vitae



Katerina Zachariadou obtained her degree in Physics from the University of Thessaloniki (BSc, 1989). She holds a PhD (1995) in the field of experimental High Energy Physics from the National Technical University of Athens. She has conducted research work at the Accelerator Laboratory-SLAC (USA) and at the European Centre for Nuclear Research-CERN (Switzerland) as research associate of the French National Centre for Scientific Research-CNRS (1996), the Italian National Institute of Nuclear Physics-INFN (1997-1999) and the National Centre for Scientific Research Demokritos (1999-2009). She has been actively involved in the development of radiation detection systems, triggering systems for particle physics detectors, simulation of physical processes, algorithms for data analysis and innovative computing systems for large scale experiments. She has been participated in National and European research programs concerning R&D for radiation detection systems as well as for advanced technologies in education. Most recently she has been engaged in the development of a portable instrument for the localization and identification of radioactive sources in collaboration with the Greek Atomic Energy Commission. Her publications comprise well over 250 papers in refereed international scientific journals and two textbooks. Since 2000 she has been taught Physics in the Physics Departments of the Technological Education Institute of Piraeus, the Hellenic Open University and the Hellenic Naval Academy. Since 2010 she is Assistant Professor at the Technological Education Institute of Piraeus.

Personal information

Name/Surname: **Katerina Zachariadou**
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Education

1991 – 1995: National Research Center «Demokritos» & National Technical University of Athens, Greece
Title of qualification awarded: PhD in Physics
Principal subjects: PhD studies in High Energy Physics
Title of Ph.D. thesis: "Rare hadronic decays of B^0_s , B^0_d και Λ_b in the LEP/ALEPH experiment at CERN"
1984 – 1989: Physics Department, University of Thessaloniki
Title of qualification awarded: Diploma in Physics
Principal subjects: Studies in Physics- Research work in the Institute of Nuclear Physics

Languages Greek (native), English (very good oral/written abilities) , French (good oral/written abilities)

Professional Experience

2010-currently: Department of Physics, Technological Institute of Piraeus

Position held: Assistant Professor

1998 – 2010: Institute of Nuclear Physics- National Research Center “Demokritos”

Occupation or position held: Research Associate

Main activities and responsibilities:

- Design and construction of experimental setups for radiation detection. Applications and technology transfer in basic or applied research fields (Medical Physics, Material Science and Industry)
- Development of triggering and data acquisition systems of radiation detection systems.
- Research and development of innovative computing systems for management and analysis of experimental data from large scale experiments.
- Development of novel techniques in Data Analysis
- Tele-research and Tele-education technology applications

2004 – 2006: Aegean University- Greece

Occupation or position held: Research Associate

Main activities and responsibilities: Development of triggering and data acquisition systems of radiation detection systems for the CMS experiment at the LHC collider (CERN)

1997 – 1998: Italian National Institute of Nuclear Physics (INFN)-Dipartimento di Fisica, Galileo-Galilei University of Florence.

Occupation or position held: Research Fellow

Main activities and responsibilities:

- Development of novel techniques in Data Analysis. Responsible for the data analysis of Firenze University research group, for the research on super-symmetric particles at the LEP II collider at CERN
- Design of silicon detectors for the CMS experiment at the LHC collider at CERN

1996: French National Centre for Scientific Research (CNRS)-Laboratory d’ Annecy-Le-Vieux, for Particle Physics.

Occupation or position held: Research Fellow

Main activities and responsibilities: Responsible for the design and construction of a scanning ring calorimeter monitor to be used for the study of the radiation in the interaction region of the accelerator PEP-II at the Research Center SLAC (Stanford California).

Educational Experience

2010 – currently: Department of Physics, Technological Institute of Piraeus

Position held: Assistant Professor

Undergraduate Courses: “Physics-I (theory)” – Department of Electronics,
“Physics-II (theory)” – Department of Mechanics,
“Physics-I (theory)” – Textile Department,
Physics I & II (laboratories)

2001 – currently: Hellenic Open University, School of Science and Technology
Sector of “Studies in Natural Sciences”

Position held: Adjunct faculty

Undergraduate Courses: Mechanics, Thermodynamics, Electromagnetism ,

2000 – 2010: Department of Physics, Technological Institute of Piraeus

Position held: Adjunct Faculty

Undergraduate Courses: “Physics-I (theory)” – Textile Department,
“Textile Physics(theory)” –Textile Department,
“Physics II (laboratories)” – Physics Department

Current Research Interests Development of a portable instrument for the localization and identification of radioactive sources in collaboration with the Greek Atomic Energy Commission and the Institute of Nuclear Physics of the National Centre for Scientific Research “Demokritos” (COCAE project, FP7 2008-2011)

Development of detector instrumentation, experimental techniques, simulation and data analysis software for the radio detection of cosmic ray showers in the atmosphere in the framework of the HELYCON (HEllenic LYceum Cosmic Observatories Network) network, in collaboration with the Aegean University.

Usage of the research infrastructure of HELYCON (HEllenic LYceum Cosmic Observatories Network) as a platform to transfer new knowledge to education, in collaboration with the Hellenic Open University and the Aegean University.

Development of novel detector instrumentation (large Micromegas detectors) in collaboration with the Hellenic Open University and the Institute of Nuclear Research of the National Centre for Scientific Research "Demokritos".

Participation in Research Projects

1) «Development and Applications of Novel Instrumentation and Experimental Methods in Astroparticle Physics».

Funding: "Thalis", NSRF Co-financed by Greece and the European Union, General Secretariat for Research & Technology.

Research contribution: contribution to data selection algorithms and to the simulation and data analysis of RF signals from cosmic ray showers in the atmosphere.

2) «COCAE-Cooperation across Europe for Cd(Zn)Te based Security Instruments»

Funding: European Commission CORDIS Security Calls FP7-SEC-2007-1.

Research contribution: in a) developing methods and algorithms for the accurate simulation of the COCAE detector and b) developing a prototype multilayer pixelated gamma radiation detector based on CdTe-CMOS technology.

3) «Data Analysis and Development of Distributed computing systems of the Grid Technology».

Funding: Co-financed by Greece and the European Union, General Secretariat for Research & Technology.

Research contribution: development of a GRID technology computer cluster in the Institute of Nuclear Physics of Demokritos in collaboration with the HellasGrid committee for testing theoretical models, management, statistical analysis and simulation of data for the CMS detector at CERN.

4) «Silicon Radiation Detectors and study of electron-proton reactions».

Funding: EPEAEK-II, Pithagoras: "Strengthening research groups in Universities".

Research contribution: development of algorithms for data selection and analysis and the production of simulation data for the CMS detector of the Large Hadron Collider at CERN.

5) «Physics with the CMS experiment at the LHC accelerator».

Funding: Co-financed by Greece and the European Union, General Secretariat for Research & Technology.

Research contribution: contribution to creation of the E.L.E.A laboratory of the Institute of Nuclear Physics aimed at developing high standards experimental devices for triggering, acquiring, and analyzing experimental data from detector devices.

«Transfer of experimental scientific inquiry in Education».

Funding: (EPEAEK Experimental education) Co-financed by Greece and the European Union, General Secretariat for Research & Technology.

Research contribution: development of innovative teaching methodology by transferring the research methodology (instrumentation and data analysis) in the High School and University education

Memberships

- Hellenic Society for High Energy Physics – since 1993.
- Physics Hellenic Society- since 2000.

List of Most Significant Publications

1. The COCAE Detector: An Instrument for Localization-Identification of Radioactive Sources C.P. Lambropoulos et al, IEEE Transactions on Nuclear Science, Vol. 58, No. 5, Oct. 2011.
2. K. Karafasoulis et al, "Evaluation of Compton scattering sequence reconstruction algorithms for a portable position sensitive radioactivity detector based on pixelated Cd(Zn)Te crystals." PaperID: NCH-2010-D3, Nausivios Chora 2010, Copyright 2006-2010: Hellenic Naval Academy
3. CMS physics: Technical design report. G.L. Bayatian et al. J.Phys.G34:2307-2455, 2011 (Citations: 41).
4. Performance of the CMS Level-1 Trigger during Commissioning with Cosmic Ray Muons., Serguei Chatrchyan et al , JINST 5 (2010) (Citations: 11).
5. New Micromegas detectors in the CAST experiment., S. Aune et al., Nucl.Instrum.Meth. A604 (2009) 15-19 (Citations: 7).
6. Performance of the Micromegas detector in the CAST experiment, Aune, S; Dafni, T; Fanourakis, G K; Ribas, E F; Geralis, T; Giganon, A; Giomataris, Yu; Irastorza, I G; Kousouris, K; Zachariadou, K, Nucl. Instrum. Methods Phys. Res., A 573 (2007) 38-40 (Citations:1).
7. Fermion pair production in $e^+ e^-$ collisions at 189-209-GeV and constraints on physics beyond the standard model. S. Schael et al. .Eur.Phys.J.C49:411-437,2007.(Citations 7).
8. The Micromegas detector of the CAST experiment P. Abbon et al. New J.Phys.9:170, 2007 (Citations: 12).
9. The CMS High Level Trigger By Adam, W et al., Eur. Phys. J. C 46 (2006) 605-667 (Citations: 33).
10. The global trigger processor emulator system for the CMS experiment. T. Geralis, S. Kyriazopoulou, C. Markou, I. Michailakis, K. Zachariadou (Democritos Nucl. Res. Ctr.), IEEE Trans.Nucl.Sci. 52 (2005) 1679-1684
11. First results from the CERN Axion Solar Telescope (CAST). K. Zioutas et al. Phys.Rev.Lett.94:121301, 2005 (Citations:161).
12. Absolute mass lower limit for the lightest neutralino of the MSSM from $e^+ e^-$ data at \sqrt{s} up to 209-GeV, A. Heister et al., Phys.Lett. B583 (2004) 247-263. (Citations 29).
13. Search for the standard model Higgs boson at LEP., R. Barate et al., Phys.Lett.B565:61-75, 2003. (Citations: 900).
14. The CERN Axion Solar Telescope (CAST): Status and prospects. I.G. Irastorza, S. Andriamonje, E. Arik, D. Autiero, F. Avignone, K. Barth, H. Brauning, R. Brodzinski, J. Carmona, S. Cebrian et al. 2003. Published in Nucl.Phys.Proc.Suppl. 114 (2003) 75-80 (Citations: 6).
15. Search for stable hadronizing squarks and gluinos in $e^+ e^-$ collisions up to $\sqrt{s} = 209\text{-GeV}$., A. Heister, Eur.Phys.J. C31 (2003) 327-342 (Citations: 32).
16. Search for scalar quarks in $e^+ e^-$ collisions at \sqrt{s} up to 209-GeV., Phys.Lett.B537:5-20,2002. (Citations: 27).
17. Final results of the searches for neutral Higgs bosons in $e^+ e^-$ collisions at \sqrt{s} up to 209-GeV., A. Heister , Phys.Lett. B526 (2002) 191-205 (Citations: 104).
18. Search for single top production in $e^+ e^-$ collisions at \sqrt{s} up to 209-GeV., A. Heister et al., Phys.Lett. B543 (2002) 173-182 (Citations: 34).

19. Search for charginos nearly mass degenerate with the lightest neutralino in $e^+ e^-$ collisions at center-of-mass energies up to 209-GeV, A. Heister et al, Phys.Lett. B533 (2002) 223-236. (citations 30)
20. The BaBar detector. B. Aubert et al.), Nucl. Instrum. Meth.A479:1116, 2002 (Citations:1157) .
21. Search for supersymmetric particles in $e^+ e^-$ collisions at \sqrt{s} up to 202-GeV and mass limit for the lightest neutralino., R. Barate et al., Phys.Lett.B499:67-84,2001 (Citations:50)
22. Search for charginos and neutralinos in $e^+ e^-$ collisions at centre-of-mass energies near 183 GeV and constraints on the MSSM parameter space / Barate, R Y et al., Eur. Phys. J. C 11 (1999) 193-216 .
23. Searches for sleptons and squarks in $e^+ e^-$ collisions at 189-GeV, Phys.Lett.B469:303-314, 1999. (Citations 23) .
24. Scalar quark searches in $e^+ e^-$ collisions at $\sqrt{s} = 181\text{-GeV}- 184\text{-GeV}$., Phys.Lett.B434: 189-199,1998. (Citations: 13).
25. Search for a scalar top almost degenerate with the lightest neutralino in $e^+ e^-$ collisions at \sqrt{s} up to 202-GeV, R. Barate et al., Phys.Lett. B488 (2000) 234-246 (Citations 17).
26. Search for charginos and neutralinos in $e^+ e^-$ collisions at center-of-mass energies near 183-GeV and constraints on the MSSM parameter space, R. Barate et al., Eur.Phys.J. C11 (1999) 193-216 (citations 20).
27. Searches for charginos and neutralinos in $e^+ e^-$ collisions at $\sqrt{s} = 161\text{-GeV}$ and 172-GeV, R. Barate et al., . Eur.Phys.J. C2 (1998) 417-439. (Citations 26)
28. A Measurement of the inclusive $b \rightarrow s$ gamma branching ratio, R. Barate et al. Phys.Lett.B429:169-187, 1998. (Citations:371).
29. Searches for scalar top and scalar bottom quarks at LEP-2, R. Barate et al., Phys.Lett. B413 (1997) 431-446. (Citations: 14).
30. Search for supersymmetric particles in $e^+ e^-$ collisions of center-of-mass energies of 130-GeV and 136-GeV. D. Buskulic et al., Phys.Lett.B373:246-260, 1996. (Citations:69).
31. Search for supersymmetric particles in $e^+ e^-$ collisions at \sqrt{s} up to 202-GeV and mass limit for the lightest neutralino, R. Barate et al., Phys.Lett. B499 (2001) 67-84. (Citations 30).

Books

- «Μηχανική –Θερμότητα», Γ. Μουστακάκης, Κ. Ζαχαριάδου, Σύγχρονη Εκδοτική, Αθήνα 2006
- «Φυσική της Ροής & Οπτική», Κ. Ζαχαριάδου, Α. Σκούντζος, Σύγχρονη Εκδοτική, Αθήνα 2011