

Konstantinos P. Baxevanakis

Postdoctoral Research Associate

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Education

- 2014 *Doctor of Philosophy* in Applied Mechanics, School of Applied Mathematical and Physical Science, National Technical University of Athens, Greece
- 2008 *Master of Philosophy* in Engineering, University of Cambridge, United Kingdom
- 2006 *Diploma* (B.Sc./M.Eng.) in Civil Engineering with First Class Honours (GPA 8.71/10, class rank 1st), University of Thessaly, Greece

Professional Experience

- 2014 – present Postdoctoral Research Associate, Department of Mechanical Engineering & Mechanics, Drexel University
- 2008 – 2014 Research Associate, School of Applied Mathematical and Physical Science, National Technical University of Athens
- 2006 – 2007 Research Associate, Department of Engineering, University of Cambridge
- 2002 – 2006 Research Assistant, Laboratory of Strength of Materials and Micromechanics, Department of Civil Engineering, University of Thessaly

Research Interests

Dislocations, Fracture Mechanics, Micromechanics, Crystal Plasticity, Wave Propagation, Generalized Continua, Contact Mechanics, Analytical and Numerical Methods

Scholarships and Awards

- 2008 Technical Chamber of Greece Honorary Diploma
- 2006 George and Marie Vergottis Cambridge Bursary, Cambridge European Trust
- 2002 – 2006 Hellenic State Scholarships Foundation Scholarship
- 2002 – 2004 Technical Chamber of Greece Award
- 2002 – 2004 Deligeorgis Foundation Award

Teaching Experience

- Substitute lectures for ‘MEM 202: Engineering Mechanics: Statics’, Undergraduate Course, Mechanical Engineering & Mechanics Department, Drexel University, Spring Quarter 2015.

- Teaching Assistant for ‘Advanced Strength of Materials’, Undergraduate Course, School of Civil Engineering, National Technical University of Athens, Spring Semesters 2012, 2013, 2014.
- Teaching Assistant for ‘Elasticity Theory’, Graduate Course, School of Applied Mathematical & Physical Sciences, National Technical University of Athens, Fall Semesters 2011, 2012, 2013.
- Teaching Assistant for ‘Continuum Mechanics’, Undergraduate Course, School of Applied Mathematical & Physical Sciences, National Technical University of Athens, Fall Semester 2012, 2013.

Research Experience

- 10/2014 – present Researcher in project ‘*Microstructure-Sensitive Investigations of Fatigue of Magnesium Alloys*’. US National Science Foundation Grant 2014.
Principal Investigator: Associate Prof. [Antonios Kontsos](#).
- 10/2014 – present Researcher in project ‘*Identification of Fatigue Precursors for Multi-scale NDE & Prognostics*’. US Office of Naval Research Young Investigator Program 2014.
Principal Investigator: Associate Prof. [Antonios Kontsos](#).
- 05/2015 – 08/2015 Researcher in project ‘*Characterization of Contrast Agents for Medical Imaging and Drug Delivery with Ultrasound via Theoretical & Numerical Analysis of Static & Dynamic Response*’. Action “Excellence I” (Greek General Secretariat for Research and Technology Program for Education and Lifelong Learning).
Principal Investigator Prof. [Nikos Pelekasis](#).
- 04/2015 – 08/2015 Researcher in project ‘*Fatigue of Materials Used in Vascular Surgery*’. Action “Excellence II” (Greek GSRT Program for Education and Lifelong Learning).
Principal Investigator Prof. [Antonios E. Giannakopoulos](#).
- 03/2013 – 02/2015 Researcher in project ‘Detection Evaluation and Total Control of Rolling Contact Fatigue (RCF) in Rails’. Action ‘Cooperation’ (Greek GSRT Operational Programme for Competitiveness and Entrepreneurship).
Principal Investigator: Prof. [Gregory Haidemenopoulos](#).
- 02/2012 – 05/2012 Researcher in project ‘Dynamic Fracture and Contact within the Framework of Generalized Continua and Thermo-Mechanics’. NTUA program for Basic Research.
Principal Investigator: Prof. [Haralambos G. Georgiadis](#).

Publications in Refereed Journals

- [J7] J.A. Cuadra, **K.P. Baxevanakis**, M. Mazzotti, I. Bartoli and A. Kontsos, 2016. Energy dissipation via acoustic emission in ductile crack initiation, *International Journal of Fracture* (In Press). doi: [10.1007/s10704-016-0096-8](https://doi.org/10.1007/s10704-016-0096-8)).
- [J6] P.A. Gourgiotis, Th. Zisis and **K.P. Baxevanakis**, 2016. Analysis of the tilted flat punch in couple-stress elasticity, *International Journal of Solids and Structures* (In Press). doi: [10.1016/j.ijsolstr.2016.01.017](https://doi.org/10.1016/j.ijsolstr.2016.01.017)).
- [J5] J. Cuadra, **K.P. Baxevanakis**, A. Loghin and A. Kontsos, 2016. Validation of a cyclic plasticity computational method using fatigue full field deformation measurements, *Fatigue & Fracture of Engineering Materials & Structures* (In Press). doi: [10.1111/ffe.12396](https://doi.org/10.1111/ffe.12396)).

- [J4] **K.P. Baxevanakis** and A.E. Giannakopoulos, 2015. Finite element analysis of discrete edge dislocations: Configurational forces and conserved integrals, *International Journal of Solids and Structures* 62, 52-65. doi: [10.1016/j.ijsolstr.2015.01.025](https://doi.org/10.1016/j.ijsolstr.2015.01.025).
- [J3] Th. Zisis, P.A. Gourgiotis, **K.P. Baxevanakis** and H.G. Georgiadis, 2014. Some basic contact problems in couple stress elasticity, *International Journal of Solids and Structures* 51, 2084-2095. doi: [10.1016/j.ijsolstr.2014.02.016](https://doi.org/10.1016/j.ijsolstr.2014.02.016).
- [J2] **K.P. Baxevanakis** and A.E. Giannakopoulos, 2010. Finite element analysis of discrete circular dislocations, *CMES - Computer Modeling in Engineering and Sciences* 60, 181-198. doi: [10.3970/cmesc.2010.060.181](https://doi.org/10.3970/cmesc.2010.060.181). Erratum (2014): *CMES* 97, 535-544. doi: [10.3970/cmesc.2014.097.535](https://doi.org/10.3970/cmesc.2014.097.535).
- [J1] A.E. Giannakopoulos, **K.P. Baxevanakis** and A. Gouldstone, 2007. Finite element analysis of Volterra dislocations in anisotropic crystals: A thermal analogue, *Archive of Applied Mechanics* 77, 113-122. doi: [10.1007/s00419-006-0065-1](https://doi.org/10.1007/s00419-006-0065-1).

Theses

- [T3] “*A computational approach for problems of interacting dislocations and cracks*”, Doctor of Philosophy dissertation, School of Applied Mathematical and Physical Science, National Technical University of Athens, Greece.
Advisor: Prof. [Haralambos G. Georgiadis](#).
- [T2] “*Microstructure modelling of tendons*”, Master of Philosophy thesis, Department of Engineering, University of Cambridge, United Kingdom.
Advisor: Dr. [Michael Sutcliffe](#).
- [T1] “*Finite element analysis of dislocations*”, Diploma thesis, Department of Civil Engineering, University of Thessaly, Greece.
Advisor: Prof. [Antonios E. Giannakopoulos](#).

Publications in Refereed Conference Proceedings

- [CP4] **K.P. Baxevanakis**, P.A. Gourgiotis and H.G. Georgiadis. Interaction of cracks with dislocations in couple-stress elasticity, *10th HSTAM International Congress on Mechanics*, Chania, Greece, May 25-27, 2013.
- [CP3] Th. Zisis, P.A. Gourgiotis, **K.P. Baxevanakis** and H.G. Georgiadis. Plane strain contact problems in couple-stress elasticity, *10th HSTAM International Congress on Mechanics*, Chania, Greece, May 25-27, 2013.
- [CP2] **K.P. Baxevanakis** and A.E. Giannakopoulos. Finite element analysis of Volterra dislocation loops, *4th International Conference from Scientific Computing to Computational Engineering (IC-SCCE)*, Athens, Greece, July 7-10, 2010.
- [CP1] A.E. Giannakopoulos and **K.P. Baxevanakis**. Finite element analysis of discrete circular dislocations, *2nd South East Conference on Computational Mechanics (SEECCM 2009)*, Rhodes, Greece, June 22-24, 2009 [Keynote paper].

Presentations in Conferences without Proceedings

- [C14] **K.P. Baxevanakis**, J. Cuadra, A. Loghin and A. Kontsos. Fatigue crack growth characterization using an integrated full field deformation and cyclic plasticity method, *The Minerals, Metals and*

- Materials Society (TMS) 145th Annual Meeting and Exhibition*, Nashville (TN), USA, February 14-18, 2016.
- [C13] A. Kontsos, **K.P. Baxevanakis** and M. Cabal. Computational modeling of microstructure-dependent strain localization in magnesium alloys, *International Symposium on Plasticity and Its Current Applications*, Keauhou Bay (HI), USA, January 3-9, 2016.
- [C12] **K.P. Baxevanakis**, M. Cabal, J. Cuadra and A. Kontsos. Microstructure-sensitive strain localization modeling in magnesium alloys, *ASME 2015 International Mechanical Engineering Congress & Exposition (IMECE)*, Houston (TX), USA, November 13-19, 2015.
- [C11] **K.P. Baxevanakis**, J. Cuadra, M. Mazzotti, I. Bartoli and A. Kontsos. Integrated approach to forward modeling of acoustic emission in ductile fracture, *Society of Engineering Science 52nd Annual Technical Meeting*, College Station (TX), USA, October 26-28, 2015.
- [C10] **K.P. Baxevanakis**, J. Cuadra, D. Liu and A. Kontsos. Modeling of the transient energy release due to damage initiation, *13th US National Congress on Computational Mechanics*, San Diego (CA), USA, July 26-30, 2015.
- [C9] **K.P. Baxevanakis**, H.G. Georgiadis and P.A. Gourgiotis. A displacement based formulation for crack problems in couple-stress elasticity, *8th GRACM International Congress on Computational Mechanics*, Volos, Greece, July 12-15, 2015.
- [C8] **K.P. Baxevanakis** and A.E. Giannakopoulos. A finite element method for the simulation of crystal defects, *8th GRACM International Congress on Computational Mechanics*, Volos, Greece, July 12-15, 2015.
- [C7] A.E. Giannakopoulos and **K.P. Baxevanakis**. Fracture and fatigue analysis of 3D cracks that appear in railway steels, *4th International Conference of Engineering Against Failure (ICEAF)*, Skiathos, Greece, June 24-26, 2015.
- [C6] A.E. Giannakopoulos and **K.P. Baxevanakis**. Crack deflection of a fatigue crack initiated by rolling contact fatigue, *4th International Conference of Engineering Against Failure (ICEAF)*, Skiathos, Greece, June 24-26, 2015.
- [C5] M. Cabal, B. Wisner, **K.P. Baxevanakis**, J. Hochhalter and A. Kontsos. Microstructurally-driven validation & quantification of acoustic emission due to twinning in magnesium, *57th Acoustic Emission Working Group Meeting (AEWG-57)*, Chicago (IL), USA, May 13-15, 2015.
- [C4] **K.P. Baxevanakis**, P.A. Gourgiotis and H.G. Georgiadis. Interaction of cracks with dislocations and dislocation dipoles in couple stress elasticity, *Euromech Colloquium 563 – Generalized Continua and their application to design of composites and metamaterials*, Cisterna di Latina, Italy, March 17-21, 2014.
- [C3] **K.P. Baxevanakis** and A.E. Giannakopoulos. Finite element analysis of discrete edge dislocations having variable core, *6th International Symposium on Defect and Material Mechanics (ISDMM13)*, Nantes, France, July 1-3, 2013.
- [C2] A.E. Giannakopoulos and **K.P. Baxevanakis**. Finite element analysis of dislocations, *5th International Symposium on Defect and Material Mechanics (ISDMM11)*, Seville, Spain, June 27 - July 1, 2011.
- [C1] A.E. Giannakopoulos, **K.P. Baxevanakis** and A. Gouldstone. Finite element analysis of Volterra-type dislocations: A thermal analogue, *International Symposium on the Mechanics of Material Forces*, Sympi, Greece, July 3-8, 2005.

Invited Lectures

- [L1] **K.P. Baxevanakis**, P.A. Gourgiotis and H.G. Georgiadis. Interaction of cracks with dislocations in couple-stress elasticity. *Department of Civil, Environmental & Mechanical Engineering, University of Trento*, Italy, November 21, 2013.

Professional Activities

Reviewer:

Computer Modeling in Engineering & Sciences, Fatigue & Fracture of Engineering Materials & Structures, International Journal of Applied Mechanics, International Journal of Solids and Structures, Journal of Engineering Materials and Technology, Materials Research

Membership in Scholarly Societies:

American Society of Mechanical Engineers (ASME), Association of Civil Engineers of Greece (ACEG), European Mechanics Society, Society of Engineering Science (SES), Technical Chamber of Greece (TCG), The Minerals, Metals & Materials Society (TMS), United States Association for Computational Mechanics (USACM)

Service to Drexel University

2015 Research Day Judge

Languages

- **English:** Excellent – Certificate of Proficiency in English (University of Michigan), TOEFL (280/300)
- **French:** Advanced – Delf A1-A6
- **Greek:** Excellent – Native speaker

Other Skills

- Experience in using the mathematical programs Mathematica, Matlab, Maple, and programming language Fortran.
- Experience in using the Finite Element codes ABAQUS (with user subroutines), ANSYS, and structural analysis software SAP2000, VK Strad and Steel.
- Excellent use of office applications Microsoft Office, Latex, and CAD software Autocad, Photoshop.
- Designed and maintained the webpage of the Hellenic Society for Theoretical & Applied Mechanics (HSTAM), <http://hstam.ntua.gr>.

References

Prof. Haralambos G. Georgiadis

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