

PROFESSOR E.C. AIFANTIS (Tel./Fax: +30-2310-995921, email: mom@mom.gen.auth.gr)

Personal Data

Date/Place of Birth: 10 October 1950/Anthili, Greece; Citizenship: Hellenic/US; Private address: 2 Olympiados Str., N. Krini, GR-55132, Thessaloniki, Greece. Tel.: +30-2310-444386, and 1010 College Avenue, MI-49931, Houghton, USA. Tel.: +1-906-482-3483

Education

Nat. Tech. Univ. Athens, Mining & Metallurgy (Diploma 1973); Univ. of Minnesota, Materials & Mechanics (Ph.D 1975).

Teaching

- University of Minnesota (Instructor: 1975-76); University of Illinois (Assistant Professor: 1976-80); University of Minnesota (Visiting Professor: 1980-82); Michigan Technological University, Houghton, USA (Professor 1982-90; Distinguished Research Professor 1990-2010; currently Emeritus Professor); Aristotle University, Thessaloniki, Greece (Professor 1990, after special honorary invitation); King Abdulaziz University (Distinguished Adjunct Professor: 2011- today).
- Undergraduate/Graduate Courses in Continuum Mechanics and Materials Science, Micromechanics and Nanomechanics.

Research/Publications/Funding

- Diffusion and Environmental / Stress Corrosion Cracking, Flow through Porous Media and Soil / Rock Mechanics, Phase Transitions and Interfaces, Micro/Nanomechanics of Elasticity, Plasticity and Fracture, Material Instabilities - Dislocation Patterning / Shear Banding / Damage Localization, Gradient Elasticity / Plasticity and Size Effects, Novel and Nanostructured Materials.
- Published over 500 papers on these subjects as articles in scientific journals and chapters in books.
- Citations: ~7400 citations and 43 h-factor (ISI Web of Science); ~6300 citations and 37 h-factor (Scopus).
- Continuous funding from the US National Science Foundation (NSF) since 1976. Also funding from the US Air Force Office of Scientific Research (AFOSR), US Army Research Office (ARO), US National Academy of Sciences, US National Research Council (NRC), Naval Research Laboratory (NRL), Sandia National Labs (SNL), NATO. Finally, substantial funding from the Commission of European Communities of EU (HCM/TMR/RTN Networks). The total research funding as Principal Investigator has been over 10 million dollars.

Seminars

- Invited in over 500 occasions to speak in conferences, universities, and research laboratories in USA, Europe, FSU, Australia, Japan, China, South America and South Africa. Served as reviewer for approximately two dozen journals and funding agencies.
- Organized over a dozen Workshops/Symposia/Conferences and served as a Member of Organizing Committees for over two dozen International Conferences.
- **Editor in Chief** of the *J. Mechanical Behavior of Materials* (ISSN 0334-8938); **Honorary Editor** of *Computer and Experimental Simulations in Engineering and Science* (ISSN 1791-3829). **On the Advisory/Editorial Board of:** *Reviews on Advanced Materials Science* (ISSN 1605-8127); *Materials Physics and Mechanics* (ISSN 1605-8119); *Acta Mechanica Solida Sinica* (ISSN 0894-9166); *Mechanical Sciences* (ISSN 2191-9151); *J. Control Engineering and Technology* (ISSN 2223-2036); *Open Mechanics Journal* (ISSN 1874-1584), *J. Advances Microel. Engng.* (ISSN 2327-7599), *Open Conf. Proc. J.I* (ISSN 2210-2892), as well as *Materials Science, Materials Sciences & Applications*. [**Formerly:** *Acta Mechanica* (ISSN 0001-5970), *J. Nano Research* (ISSN 1662-5250); *Mechanics of Cohesive-Frictional Materials* (ISSN 1099-1484); *Numerical and Analytical Methods in Geomechanics* (ISSN 106-222).]
- Joint ASME/ASCE/SES Symposium organized in his honor, 1-3 June 2005, Baton Rouge, USA.

Editorships

1. E.C. Aifantis and L. Davison, *Media with Microstructures and Wave Propagation*, Special Issue of *Int. J. Engng. Sci.*, Vol. 22/Nos. 8-10/pp. 959-1224, Pergamon Press, 1984.
2. E.C. Aifantis and J.P. Hirth, *The Mechanics of Dislocations* [248 pages], ASM, Metals Park, 1985.
3. E.C. Aifantis and J. Gittus, *Phase Transformations* [302 pages], Elsevier Appl. Sci. Publ., London-New York, 1986.
4. E.C. Aifantis, *Lectures in Engineering Science*, Special Issue of *Res Mechanica*, Vol. 21/No.4/pp.287-400, Elsevier Appl. Sci. Publ., 1987.
5. E.C. Aifantis, D. Walgraef and J. Gittus, *Material Instabilities*, Special Issue of *Res Mechanica*, Vol. 23/ Nos. 2-3/ pp. 97-305, Elsevier Appl. Sci. Publ., 1988.
6. E.C. Aifantis, Proc. Aristotle's 23 Centuries Celebration (Thessaloniki/ August 1990), Special Issues of the *J. Mechanical Behavior of Materials*, Vol.4/Nos.1-4/pp. 1-397 and Vol.5/Nos 1-3/pp. 3-375, Freund Publ. House, 1992-94.
7. E.C. Aifantis, *Novel Materials, Processes and Microstructures* (Symp. in honor of Th. Skoulikidis; Thessaloniki/ January 1993), [180 pages], Graphima Publ., Thessaloniki, 1993.
8. E.C. Aifantis, Proc. 2nd Euroconference and Int. Symp. on Material Instabilities and Fracture (Thessaloniki/ August 1997) [for 1st Euroconference and US Workshop, held in Thessaloniki in August 1996, ABSTRACTS available], Special Issue of the *J. Mechanical Behavior of Materials*, Vol.11/Nos.1-3/pp. 1-264, Freund Publ. House, 2000.
9. E.C. Aifantis and A.N. Kounadis, Proc. 6th Nat. Cong. of Mechanics (In memory of P.S. Theocaris; Thessaloniki/ July 2001), Vols. I [426 pages] / II [406 pages] / III [146 pages], Giahoudi-Giapouli Publ., Thessaloniki, 2001.
10. E.C. Aifantis, Proceedings/Abstracts 5th EUROMECH Solid Mechanics Conference (Thessaloniki/August 2003), Vols. I [426 pages] / II [406 pages] / III [146 pages], Giahoudi-Giapouli Publ., Thessaloniki, 2003.
11. E.C. Aifantis, Proceedings 1st World Symposium on Multiscale Material Mechanics and Engineering Sciences: Dedicated to the Memory of F. Nabarro, E. Hart, R. Rivlin (Thessaloniki - May 2007), forthcoming, 2009.
12. E.C. Aifantis, Plenary/Keynote Lectures and Special Symposia of IC-4N (from Nanoparticles & Nanomaterials to Nanodevices & Nanosystems/Chalkidiki - June 2008), forthcoming, 2009.

Scientific Research and Leadership Profile

• *Research*

E.C. Aifantis has promoted highly interdisciplinary work in mechanics of materials by bringing into the field of solids mechanics ideas from diffusion theory, chemical reactions, and nonlinear physics. Among his initial contributions, while at the University of Illinois, was the development of stress-assisted diffusion theories with applications to hydrogen embrittlement and stress corrosion cracking, as well as flow through porous media theories (double porosity theory) with applications to consolidation and subsidence. This work motivated the concept of viewing a stressed solid as an active medium the deformation of which is governed by the production/annihilation and transport of defect populations. This led to the development of the first models to interpret self-organization of dislocations and deformation patterning. The Walgraef-Aifantis model was the first to predict widths and spacings of the layered dislocation structure of the persistent slip bands observed in fatigued crystals; this model is contained as an example in Chapter 6 of the Nobelist's Ilya Prigogine book "Exploring Complexity", Freeman, New York (1989). This work has motivated, in part, a large number of follow-up works on dislocation patterning, including recent papers on discrete dislocation dynamics simulations (e.g. Kubin, Zbib, Groma and others).

Another important contribution (jointly with Jim Serrin) in early eighties, while at the University of Minnesota, was the revisit of Maxwell's rule and van der Waals theory of fluid interfaces within a strictly mechanical framework incorporating higher order density gradients in the interfacial stress tensor. Among the results were the relocation of Maxwell's line and the derivation of transition, reversal and periodic solutions for fluid interfaces. This work motivated in part a large number of works in continuum mechanics (Coleman, Gurtin and others) in the area of Continuum Phase Transitions.

Later in mid eighties, while at Michigan Tech, he proposed the first gradient plasticity model to predict the thickness of shear bands and eliminate the mesh-size dependence of FE calculations in the strain softening regime. This was used in FE codes developed by de Borst, Tomita and others to solve large-scale engineering problems for which classical plasticity did not work. Other gradient plasticity models such as those proposed by Fleck/Hutchinson and co-workers were developed later in the mid-nineties and a large number of researchers are working today on such theories for interpreting size effects and other phenomena at the micron scale.

In the early and mid nineties, jointly with his experimental collaborators Walter Milligan and Steve Hackney at Michigan Tech, he directed a project on nanostructured materials and "coined" the term "nanomechanics" as he did earlier with "dislocation patterning" and "material instabilities". They identified, theoretically and experimentally, the critical grain size regime where plasticity transition occurs from grain rotation/sliding in the absence of dislocation activity to intragranular avalanche-like dislocation motion. This mechanism has also been numerically confirmed by MD calculations recently performed by Swygenhoven's group at PSI-Switzerland. For bulk nanocrystals they discovered another plasticity transition mechanism controlled by "multiple" or "massive" shear banding without any hardening, not observed for the conventional grain size counterparts of these materials which are always strain-hardened. The first mechanical models at the nanoscale to explain the observed behavior were developed at that time and these models are currently being improved for applications to nanotechnology.

Since 2000, while at Aristotle University of Thessaloniki where he currently holds his regular appointment (while maintaining a distinguished research professorship at Michigan Tech), he continued with students and postdocs his earlier work on gradient elasticity (by expanding on his non-singular solutions previously derived with his co-workers Altan, Gutkin, Ru et al) which has recently become a popular topic in Greece (Aravas, Beskos, Exadaktylos, Georgiadis, Giannakopoulos, Vardoulakis) and elsewhere (EU, US, China). Work is focused on dislocations/disclinations and cracks/interfaces, as well as nanomaterials including nanotubes and nanomembranes. Gradient theory and multi-element defect kinetics are used to capture mechanical behavior at the nanoscale. Wavelet analysis and neural networks are used for bridging the length scale spectrum. Main senior collaborators included A. Romanov / I. Ovid'ko (St. Petersburg, Russia) on defect theory, A. Carpinteri / N. Pugno (Torino, Italy) on fractals and size effects, S. Forest (Ecole des Mines, France) and P. Steinmann (Univ. Erlangen, Germany) on gradient plasticity, H. Askes (Univ. of Sheffield) and M. Lazar (Darmstadt Univ. Tech.)/G. Maugin (Univ. Paris VI) on gradient elasticity, M. Zaiser (Univ. Edinburgh, UK) on stochastic dynamics/avalanches and random plasticity, I. Groma (Eotvos, Hungary) on discrete dislocation dynamics, and I. Vardoulakis (Nat. Tech. Univ. Athens, Greece) on soil mechanics and granular media.

During this period he also supervised a large number of Greek and European doctoral students and postdocs through his coordination of a European TMR/Training and Mobility of Researchers Network on *Spatio-Temporal Instabilities in Deformation and Fracture* (ERB-FMRX-CT96-0062; 1.76 MECU) and a RTN/Research Training Network on *Deformation and Fracture Instabilities in Novel Materials and Processes/DEFINO* (HPRN-CT-2002-00198; 1.5 MEuros), and through his participation in a RTN/Research Training Network on *Degradation and Instabilities in Geomaterials with Application to Hazard Mitigation/DIGA* (HPRN-CT-2002-00220; 175 kEuros), as well as his coordination of 3 INTAS Projects (INTAS-93-3213; 30kECU, INTAS-93-3213 – extension; 40 kECU, INTAS-94-4380; 24 kECU), in addition to PENED (42 MDr) and PYTHAGORAS (50 kEuros) Grants from the Greek Government.

- **Leadership**

Organizer of a series of workshops and symposia on “material instabilities”, “dislocation patterning” and “gradient plasticity”. Active collaboration with colleagues from different countries and disciplines. In a first International Conference organized in Thessaloniki in 1990 under joint sponsorship of the US National Science Foundation and the Commission of European Communities, he supported the participation of about 50 scientists from the former Soviet Union. At that time the idea of establishing an International Research Center in Thessaloniki was conceived. Recently this idea has been revived with the interest of the former Minister of Serbia D. Sumarac (also a Professor of Mechanics at Belgrade University) and International Colleagues in Governmental positions with the attention of the former US Senator P. Sarbanes.

Most recently the Laboratory of Mechanics that he is coordinating was chosen by the youngest ERC Starting Grant Recipient K. Aifantis (*Physics Today*: April 2008 issue; *BBC*: <http://news.bbc.co.uk/2/hi/science/nature/7264828.stm>; *Science Careers*: http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/2008_03_21/career_a0800043) to conduct her 5-year research grant of 1.13 million Euros. Also it has been awarded with an EC International Incoming Fellowship for A. Romanov to conduct their research for the next 2 years with a grant of 200 kEuros.

Research ties are also kept with Michigan Tech and other US Universities (I. Chasiotis – U. of Illinois/Urbana, L. Zhigilei – U. of Virginia, R. Ballarini – U. of Minnesota, S. Eppell - CWRU) through a NIRT grant (*Novel Experiments and Models for the Nanomechanics of Polymeric and Biological Nanofibers* / NSF NIRT Grant DMI #0532320; 1.3 million USD).

Finally, in the last 5 years he actively participated in the establishment of educational curricula in Nanoscience. He has been a founding member of *NUE: Undergraduate Exploration of Nano-Science, Applications and Societal Implications at Michigan Tech* (<http://nano.mtu.edu/nueindex.htm>), as well as of the Graduate Program at Aristotle University *Nanosciences and Nanotechnologies/NN* (<http://nn.physics.auth.gr/ensite/index.htm>).

Partial List of Supervised Young Reserchers (Students/Post-docs) currently in Academia

- M. Avlonitis (Lecturer - Ionion University - Greece)
- I. Chasiotis (Associate Professor - University of Illinois at Urbana-Champaign - USA)
- G. Efremidis (Part-time Lecturer - University of Volos - Greece)
- K. Kalaitzidou (Assistant Professor - Georgia Tech - USA)
- A. Konstantinidis (Lecturer - Aristotle University of Thessaloniki- Greece)
- I. Mastorakos (Research Professor - Washington State University - USA)
- I. Tsagrakis (Part-time Lecturer - University Crete - Greece)
- *T. Ioannidou (Assistant Professor - Aristotle University of Thessaloniki- Greece)
- *E. Meletlidou (Assistant Professor - Aristotle University of Thessaloniki- Greece)
- H. Askes (Professor - University of Sheffield)
- D. Bammann (Chair and Professor - Mississippi State University - USA)
- P. Cornetti (Assistant Professor - Politecnico di Torino - Italy)
- M. Seefeldt (Assistant Professor - Katholieke Universiteit Leuven - Belgium)
- D. Unger (Professor - University of Evansville - USA)
- M. Zaiser (Professor - University of Edinburgh)
- H. Zbib (Professor/Director - Washington State University - USA)
- *M. Brocato (Istituto di Elaborazione della Informazione - Italy)
- *N. Pugno (Associate Professor - Politecnico di Torino - Italy)
- *C. di Prisco (Professor - Politecnico di Milano - Italy)
- *M. Lazar (Head of Emmy Noether Research Group - Darmstadt Univ. Tech. - Germany)
- *M. Gutkin (Professor - St. Petersburg - Rusia)
- *K.-Y. Xu (Professor - Shanghai University - China)

*In part (3-6 months) and jointly supervised under TMR/RTN Networks

List of Publications

1975

1. E.C. Aifantis and W.W. Gerberich, Dislocation dynamics and stress relaxation, *Metallurgica Chronica* 23, 27-34 (1975).

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2. E.C. Aifantis and W.W. Gerberich, A theoretical review of stress relaxation testing, *Materials Science and Engineering* 21, 107-113, (1976).
3. E.C. Aifantis, Diffusion of a perfect fluid in a linear-elastic stress field, *Mechanics Research Communications* 3, 245-250 (1976).
4. E.C. Aifantis and D.E. Beskos, Dynamic universal solutions for fiber reinforced incompressible isotropic elastic materials, *Journal of Elasticity* 6, 353-367 (1976).
5. E.C. Aifantis and W.W. Gerberich, Diffusion of gases in linear elastic stress fields, *Effect of Hydrogen in Behavior of Materials*, pp. 350-354, Wyoming (1976).

1977

6. E.C. Aifantis, Studies on the phenomenon of diffusion of a gas in a stressed heated linear elastic solid: I. A physicomathematical formalism, *Technica Chronica* 4, 5-10 (1977).
7. E.C. Aifantis, Studies on the phenomenon of diffusion of a gas in a stressed heated linear elastic solid: II. A diffusion theory, *Technica Chronica* 4, 10-15 (1977).
8. E.C. Aifantis and D.E. Beskos, Inflation bending extension and azimuthal shearing of a fiber-reinforced elastic sector of a circular tube, *Acta Mechanica* 26, 159-170 (1977).
9. E.C. Aifantis, W.W. Gerberich and D.E. Beskos, Diffusion equations for a mixture of an elastic solid and an elastic fluid, *Archives of Mechanics* 29, 339-353 (1977).
10. E.C. Aifantis and W.W. Gerberich, Gaseous diffusion in a stressed thermoelastic solid; Part I: The thermomechanical formulation, *Acta Mechanica* 28, 1-24 (1977).
11. E.C. Aifantis and W.W. Gerberich, Gaseous diffusion in a stressed thermoelastic solid; Part II: Thermodynamic structure and transport theory, *Acta Mechanica* 28, 25-47 (1977).
12. E.C. Aifantis, D.E. Beskos, and W.W. Gerberich, Diffusion in dislocation fields, *Archives of Mechanics* 29, 723-740 (1977).
13. E.C. Aifantis and W.W. Gerberich, A path independent integral for symmetric stress-diffusion fields surrounding line-cracks, *Fracture* 77 3, 257-266, Waterloo (1977).
14. E.C. Aifantis, Introducing a multi-porous medium, *Developments in Mechanics* 9, 209-211, (1977).
15. E.C. Aifantis, Some remarks on the solid state diffusivity tensor, *Cancam* 77 2, 957-958, Vancouver (1977).
16. E.C. Aifantis, A continuum model for the human placenta, *Symposium on Biomechanics (ASME)* 23, 197-198, New Haven (1977).
17. E.C. Aifantis and D.E. Beskos, A mathematical model for diffusion in a screw dislocation field, *Proc. 1st Int. Conf. on Math. Modeling* 3, 1687-1696, (1977).
18. E.C. Aifantis, Mathematical modeling for water flow in stems of plants, *Proc. 1st Int. Conf. on Math Modeling* 2, 1083-1090, (1977).

19. E.C. Aifantis, Continuum theory of degradation, *Environmental Degradation of Engineering Materials*, Eds. M.R. Louthan and R.P. McNitt, pp. 151-160, Virginia Tech. Print. Dept., Blacksburg (1977).
20. D.J. Unger and E.C. Aifantis, Solutions of some diffusion equations related to stress corrosion cracking, *Environmental Degradation of Engineering Materials*, Eds. M.R. Louthan and R.P. McNitt, pp. 131-140, Virg. Tech. Print. Dept., Blacksburg (1977).
21. E.C. Aifantis, A mechanical model for solid state diffusion: effect of the constitutive character, *Recent Advances in Engineering Science*, pp. 767-772, Bethelam (1977).

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22. E.C. Aifantis and W.W. Gerberich, A new form of exact solutions for mode I, II, III crack problems and implications, *Engineering Fracture Mechanics* 10, 95-108 (1978).
23. E.C. Aifantis and W.W. Gerberich, Diffusion of a gas in a linear elastic solid, *Acta Mechanica* 29, 169-184 (1978).
24. E.C. Aifantis, A proposal for continuum with microstructure, *Mechanics Research Communications* 5, 139-145 (1978).
25. E.C. Aifantis, Towards a rational modeling for the human placenta, *Mathematical Biosciences* 40, 281-301 (1978).
26. E.C. Aifantis, Blood flow in the placenta, 1st Mid-Atlantic Conf. on Bio-Fluid Mech. 7, 85-91 (1978).
27. M. Baer and E.C. Aifantis, Strain rate effects on diffusion, *Recent Advances in Engineering Science*, 33-37, Gainesville (1978).
28. E.C. Aifantis, Diffusion of a perfect fluid in a linear elastic stress field, *Zentralblatt für Mathematik* 366, (76070) 454 (1978).
29. E.C. Aifantis, Recent results in the phenomenological theory of diffusion in solids, TAM Report No. 430, UILU-ENG 78-6008, NSF ENG 77-10176, University of Illinois, Urbana (1978).

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30. E.C. Aifantis, Continuum basis for diffusion in regions with multiple diffusivity, *Journal of Applied Physics* 50, 1334-1338 (1979).
31. E.C. Aifantis, A new interpretation of diffusion in high diffusivity paths-A continuum approach, *Acta Metallurgica* 27, 683-691 (1979).
32. E.C. Aifantis, Comments on the calculation of the formation volume of vacancies in solids, *Physical Review B* 19, 6622-6624 (1979).
33. E.C. Aifantis, On the response of fissured rocks, *Developments in Mechanics* 10, 249-252 (1979).
34. R.K. Wilson and E.C. Aifantis, A coupled diffusion-deformation theory, *Developments in Mechanics* 10, 255-260 (1979).
35. D.J. Unger and E.C. Aifantis, Flow in stems of plants, 3rd ASCE Eng. Mech. Div. Specialty Conf., pp. 501-504 (1979).

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36. P. Varotsos and E.C. Aifantis, Comments on the diffusion of a gas in linear elastic solid, *Acta Mechanica* 36, 129-133 (1980).
37. E.C. Aifantis and J.M. Hill, On the theory of diffusion in media with double diffusivity I-Basic mathematical results, *Quarterly Journal of Mechanics and Applied Mathematics* 33, 1-21 (1980).
38. J.M. Hill and E.C. Aifantis, On the theory of diffusion in media with double diffusivity II-Boundary value problems, *Quarterly Journal of Mechanics and Applied Mathematics* 33, 23-41 (1980).

39. E.C. Aifantis, On the problem of diffusion in solids, *Acta Mechanica* 37, 265-296 (1980).
40. E.C. Aifantis and D.E. Beskos, Heat extraction from hot dry rocks, *Mechanics Research Communications* 7, 165-170 (1980).
41. E.C. Aifantis, Further comments on the problem of heat extraction from hot dry rocks, *Mechanics Research Communications* 7, 219-226 (1980).
42. E.C. Aifantis, On Barenblatt's problem, *International Journal of Engineering Science* 18, 857-867 (1980).
43. E.C. Aifantis, Preliminaries on degradation and chemomechanics, NSF Workshop on a Continuum Mechanics Approach to Damage and Life Prediction, Eds. D.C. Stouffer, E. Krempl, J.E. Fitzgerald, pp. 159-173, Carrolton (1980).
44. E.C. Aifantis, The mechanics of diffusion in solids, TAM Report No. 440, UILU-ENG 80-6001, NSF ENG 77-10176, University of Illinois, Urbana (1980).
45. E.C. Aifantis, Continuum theories of diffusion and infiltration: Part I, *Engineering Science Perspective* 5, 10-20 (1980).

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46. E.C. Aifantis, Elementary physicochemical degradation processes, *Mechanics of Structured Media*, Ed. A.P.S. Selvadurai, pp. 301-317, Elsevier, Amsterdam-Oxford-New York (1981).
47. D.J. Bammann and E.C. Aifantis, On the perfect lattice-dislocated state interaction, *Mechanics of Structured Media*, Ed. A.P.S. Selvadurai, pp. 79-91, Elsevier, Amsterdam-Oxford-New York (1981).
48. R.K. Wilson and E.C. Aifantis, The skin effect in double porosity media, *Mechanics of Structured Media*, Ed. A.P.S. Selvadurai, pp. 335-341, Elsevier, Amsterdam-Oxford-New York (1981).
49. E.C. Aifantis, Continuum theories of diffusion and infiltration: Part II, *Engineering Science Perspective*, Vol. 6 pp. 9-20. (*This was actually printed in the last issue of SES perspective in 1987).
50. E.C. Aifantis, Embrittlement: A continuum formulation, in *Environm. Degrad. Engng. Matls.*, in Hydrogen, Eds. M.R. Louthan, R.P. McNitt, R.D. Sisson, pp. 215-221, Virg. Tech. Print. Dept., Blacksburg (1981).
51. W.W. Gerberich and E.C. Aifantis, Stress corrosion cracking. A continuum formulation, in: *Environm. Degrad. Engng. Matls. in Hydrogen*, Eds., M.R. Louthan, R.P. McNitt, R.D. Sisson, pp. 557-563, Virg. Tech. Print. Dept., Blacksburg (1981).
52. D.J. Unger and E.C. Aifantis, Coupled stress-concentration spinodals, in: *Environm. Degrad. Engng. Matls. in Hydrogen*, Eds. M.R. Louthan, R.P. McNitt, R.D. Sisson, pp. 585-591, Virg. Tech. Print. Dept., Blacksburg (1981).

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53. P.A. Taylor and E.C. Aifantis, On the theory of diffusion in linear viscoelastic media, *Acta Mechanica* 44, 259-298 (1982).
54. D.J. Bammann and E.C. Aifantis, On a proposal for a continuum with microstructure, *Acta Mechanica*, 45, 91-121 (1982).
55. R.K. Wilson and E.C. Aifantis, On the theory of stress assisted diffusion - I, *Acta Mechanica* 45, 273-296 (1982).
56. R.K. Wilson and E.C. Aifantis, On the theory of consolidation with double porosity - I, *Int. J. Eng. Sci.* 20, 1009-1035 (1982).
57. J.A. Colios and E.C. Aifantis, On the problem of continuum theory of embrittlement, *Res Mechanica* 5, 67-85 (1982).
58. D.J. Unger, W.W. Gerberich, and E.C. Aifantis, Further remarks on the implications of steady state stress assisted diffusion on environmental cracking, *Scripta Metallurgica* 16, 1059-1064 (1982).
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60. E.C. Aifantis and J.B. Serrin, Towards a mechanical theory of phase transformations, Technical Report, Corrosion Research Center, University of Minnesota (1980,82).
61. E.C. Aifantis, Some thoughts on degrading materials, in: NSF Workshop on Mechanics of Damage and Fracture, pp. 1-12, Eds. S.N. Atluri and J.E. Fitzgerald, Atlanta (1982).

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62. E.C. Aifantis, Dislocation kinetics and the formation of deformation bands, Defects Fracture and Fatigue, Eds. G.C. Sih & J.W. Provan, pp. 75-84, Martinus Nijhoff (1983).
63. D.J. Unger and E.C. Aifantis, On the theory of stress assisted diffusion - II, Acta Mechanica 47, 117-151 (1983).
64. D.J. Unger, W.W. Gerberich, and E.C. Aifantis, Further remarks on an exact solution for crack problems, Engineering Fract. Mech. 18, 735-742 (1983).
65. V. Alexiades and E.C. Aifantis, Singular problems in the theory of stress assisted diffusion, SIAM J. Math. Anal. 14, 925-933 (1983).
66. M.E. Plesha and E.C. Aifantis, On the modeling of rocks with microstructures, 24th U.S. Symp. on Rock Mechanics, Ed. E.R. Hoskins, pp. 27-35, ASTM (1983).
67. E.C. Aifantis and J.B. Serrin, The mechanical theory of fluid interfaces and Maxwell's rule, J. of Colloid and Interface Sciences 96, 517-529 (1983).
68. E.C. Aifantis and J.B. Serrin, Equilibrium solutions in the mechanical theory of fluid microstructures, J. of Colloid and Interface Sciences 96, 530-547 (1983).

1984

69. M.Y. Khaled, D.E. Beskos and E.C. Aifantis, On the theory of consolidation with double porosity - III: A finite element formulation, Int. J. Num. Anal. Meth. Geomech. 8, 101-123 (1984).
70. E.C. Aifantis, Microscopic processes and macroscopic response, in: Mechanics of Engineering Materials, Eds. C.S. Desai and R.H. Gallagher, pp. 1-22, Wiley (1984).
71. E.C. Aifantis, On the Mechanics of modulated structures, in: Modulated Structure Materials, NATO ASI Series 83, Ed. T. Tsakalakos, pp. 357-385, Martinus-Nijhoff (1984).
72. E.C. Aifantis, Maxwell and van der Waals revisited, in: Phase Transformations in Solids, Ed. T. Tsakalakos, pp. 37-49, North-Holland (1984).
73. E.C. Aifantis, Remarks on media with microstructures, Int., J. Engng. Sci. 22, 961-968 (1984).
74. D.J. Unger and E.C. Aifantis, Dynamic effects in spinodal decomposition, Int. J. Engng. Sci. 22, 1219-1224 (1984).
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