Francisco Armero

University of California at Berkeley
Department of Civil and Environmental Engineering
713 Davis Hall (MC 1710), Berkeley, CA 94720-1710, U.S.A.
Phone: +1-(510)-643-0813 FAX: +1-(510)-643-8928
e-mail address: armero@ce.berkeley.edu
web page: http://www.ce.berkeley.edu/~armero

EDUCATION:

Stanford University (Stanford, CA), Ph.D., Mechanical Engineering, minor in Mathematics, awarded in January 1994.

Stanford University (Stanford, CA), MS, Mechanical Engineering, awarded in June 1989.

Universitat Politècnica de Catalunya (Barcelona, Spain), Ingeniero de Caminos, Canales y Puertos (six years degree with an equivalent level to M.S. in Civil Engineering, minor in Structural Mechanics and Engineering), awarded in July 1988.

PROFESSIONAL EXPERIENCE:

University of California, Berkeley, Professor, 2003-present.

University of California, Berkeley, Associate Professor, 1999-2003.

University of California, Berkeley, Assistant Professor, 1994-1999.

Universitat Politècnica de Catalunya, Visiting Professor, 2000-2001.

Stanford University, Postdoctoral Fellow, 1993-1994.

Stanford University, Research and Teaching Assistant, 1988-1993.

Universitat Politècnica de Catalunya, Research Assistant, 1987-1988.

Roubin & Janeiro Inc. (Fairfax, VA), Engineering Assistant, 1986.

COBPKM-Motostal (Warsaw, Poland), Research Assistant, 1985.

HONORS, AWARDS:

Fellow of the US Association of Computational Mechanics (USACM Fellows Award), 2011.

Fellow of the International Association of Computational Mechanics (IACM Fellows Award), 2004.

> (Citation: "The IACM by action of the Executive Council has elected Francisco Armero Fellow in recognition of his contributions to the field of computational mechanics")

The IACM Young Investigator Award, International Association for Computational Mechanics (IACM), 2002.

> (Award having been given every four years at the World Congress on Computational Mechanics to researchers 40 years old or younger. The plaque of the award reads: "The International Association for Computational Mechanics awards the Young Investigator Award to Francisco Armero for his outstanding contributions in the field of computational mechanics.")

Visiting Professorship, PIV Fellowship Program by La Generalitat (government of Catalonia, autonomous region of Spain), 2000-2001.

The Juan C. Simo Award and medal, Spanish Association for Numerical Methods in Engineering (SEMNI), 1999.

Best Paper Award, Engineering Computations, 1997.

NSF CAREER Award, National Science Foundation (NSF), 1997.

ONR Young Investigator Award, Office of Naval Research (ONR), 1996.

International Fellowship from the "La Caixa" Foundation (Barcelona, Spain), 1988-1990.

PROFESSIONAL ACTIVITIES:

Affiliations:

- International Association for Computational Mechanics (IACM), Fellow.
- US Association for Computational Mechanics (USACM), Fellow.
- American Society of Mechanical Engineers (ASME), member.
- American Society of Civil Engineers (ASCE), member.
- American Academy of Mechanics (AAM), member.

Member of the editorial/advisory board of:

- University Press of Ecole Centrale de Nantes, January 2011-present.
- Revista Internacional de Métodos Numéricos para Cálculo y Diseño en Ingeniería, October 2009-present.
- Annals of Solid and Structural Mechanics, October 2008-present.
- Informes de la Construcción, December 2006-present.
- Computers & Concrete, April 2003-present.
- Finite Elements in Analysis and Design, February 2002-present.
- Computer Methods in Applied Mechanics and Engineering, June 2001-present.
- International Journal for Numerical Methods in Engineering, January 2001-present.
- Computers & Structures, November 1998-present.
- International Journal of Numerical Methods in Fluids, November 1997-January 2008.
- ASCE Journal of Engineering Mechanics, Associate Editor, Sept. 2003-Oct. 2005.
- Communications in Numerical Methods in Engineering, April 2005-January 2010.

Guest editor:

- Special issue on "Computational Failure Mechanics III", Computer Methods in Applied Mechanics and Engineering, volume 193, issues 30-32, 2004.
- Special issue on "Computational Failure Mechanics II", International Journal for Numerical Methods in Engineering, volume 56, issue 14, 2003.
- Special issue on "Computational Failure Mechanics", International Journal of Solids and Structures, volume 137, issues 48-50, 2000.
- Special issue on "High Performance Finite Element Methods for Nonlinear Solid Mechanics" Computers & Structures, volume 75, issue 3, 2000.
- Special issue on "The Theory and Prediction of Localized Failure in Materials", Mechanics of Cohesive-Frictional Materials, volume 4, issue 2, 1999.

Reviewer for technical journals, including:

- Computer Methods in Applied Mechanics and Engineering.
- International Journal for Numerical Methods in Engineering.
- International Journal for Numerical Methods in Fluids.
- Communications in Numerical Methods in Engineering.
- International Journal of Solids and Structures.
- Computers and Structures.
- Finite Element in Analysis and Design.
- Computers and Concrete.
- Engineering Computations.
- Journal of Nonlinear Science.
- ASME Journal of Applied Mechanics.
- ASCE Journal of Engineering Mechanics.
- ASCE Structures Journal.
- AIAA Journal.
- Computational Mechanics.
- Mechanics of Cohesive–Frictional Materials.
- Meccanica.
- Engineering Fracture Mechanics.
- Computational Material Science.
- Journal of the Mechanics and Physics of Solids.
- European Journal of Mechanics/A.
- International Journal of Structural Engineering and Mechanics
- Journal of Engineering Materials and Technology.
- International Journal of Computational Engineering Science.
- ZAMM Zeitschrift fuer Angewandte Mathematik und Mechanik.
- International Journal of Fracture.
- Informes de la Construcción.
- Computer Modeling in Engineering & Sciences.
- Mechanics Research Communications.

- Computer Methods in Biomechanics and Biomechanical Engineering.

Reviewer and panelist for governmental agencies and academic institutions:

- National Science Foundation (NSF), Mechanics and Materials Program.
- National Science Foundation (NSF), Applied Mathematics Program.
- National Science Foundation (NSF), Interdisciplinary Research Program.
- National Science Foundation (NSF/OARU), Graduate Research Fellowship Program.
- Air Force Office of Scientific Research (AFOSR), Computational Mathematics Program.
- Air Force Office of Scientific Research (AFOSR), Computational Physics Program.
- Air Force Research Laboratory (AFRL), Eglin AFB.
- National Research Council, AFOSR Mechanics Review Panel.
- Office of Naval Research (ONR), Computational Mechanics Program.
- Army Research Office (ARO), Mechanical Sciences Division.
- Department of Defense, SMART Scholarship Program.
- NASA, Office of Earth Sciences
- Agencia Nacional de Evaluación y Prospectiva (ANEP), Government of Spain, Mechanical, Naval and Aeronautical Engineering Program, Madrid, Spain.
- Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR), Generalitat de Catalunya, Government of Catalonia, Barcelona, Spain.
- Alexander von Humboldt Foundation, Germany.
- National Research Foundation, South Africa.
- Fundacao para Ciencia e Tecnologia, Portuguese NSF.
- University of New Mexico, Department of Mechanical Engineering.
- University of Wales at Swansea, UK, Civil and Computational Engineering Centre.
- Northwestern University, Department of Civil and Environmental Engineering.
- Stanford University, Department of Mechanical Engineering.
- University of Illinois at Urbana-Champaign, Department of Civil and Environmental Engineering.

Committee service:

- Committee on Computational Mechanics, ASCE Engineering Mechanics Division (August 1999-present), vice-chair (2003-2004, 2006-2009), chair (August 2004-2006).
- International Scientific Committee, 10th World Congress on Computational Mechanics (WCCM 10), Sao Paulo, Brazil, July 9-13, 2012.
- International Scientific Committee of Computational Technologies in Concrete Structures (CTCS'11), Seoul Korea, 18-23 September 2011.
- Technical Advisory Committee, 11^{th} International Conference on Computational Plasticity (COMPLAS XI), Barcelona, Spain, September 7-9, 2011.
- International Scientific Committee, 11th US National Congress on Computational Mechanics (USNCCM 11), Minneapolis MN, July 25-28, 2011.
- Technical Advisory Committee, International Conference on Coupled Problems, Kos Island, Greece, June 20-22, 2011.

- International Scientific Committee, International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC 2011), Barcelona, Spain, June 6-8, 2011.
- International Advisory Board, 3^{rd} International Conference on Computational Dynamics and Earthquake Engineering (COMPDYN11), Corfu, Greece, May 26-28, 2011.
- Scientific Advisory Committee, 10^{th} International Conference on Computational Structures Technology (CST2010), Valencia, Spain, September 14-17, 2010.
- Technical Advisory Committee, 10^{th} International Conference on Computational Plasticity (COMPLAS X), Barcelona, Spain, September 2-4, 2009.
- International Advisory Board, Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN09), Island of Rhodes, Greece, June 22-24, 2009.
- Technical Advisory Committee, International Conference on Coupled Problems, Ischia Island, Italy, May 8-10, 2009.
- International Advisory Board, 1^{st} International Conference on Computational Technologies in Concrete Structures (CTCS09), Seoul, Korea, May 2009.
- Scientific Advisory Committee, 9^{th} International Conference on Computational Structures Technology, Athens, Greece, September 2-5, 2008.
- Local Organizing Committee, 9 US National Congress on Computational Mechanics (USNCCM 9), San Francisco CA, July 17-19, 2007.
- International Advisory Board, Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN07), Rethymnon, Crete, June 13-15, 2007.
- Technical Advisory Committee, International Conference on Coupled Problems, Ibiza, Spain, May 21-23, 2007.
- Technical Advisory Committee, 9^{th} International Conference on Computational Plasticity (COMPLAS IX), Barcelona, Spain, September 5-7, 2007.
- Scientific Programme Committee, 7^{th} World Congress on Computational Mechanics (WCCM7), Los Angeles CA, U.S.A., July 16-22, 2006.
- Scientific Committee, III European Conference on Computational Mechanics, Lisbon, Portugal, June 5-9, 2006.
- Scientific Advisory Committee, 8^{th} International Conference on Computational Structures Technology, Las Palmas de Gran Canaria, Spain, September 12-15, 2006.
- Scientific Committee, 5^{th} International Conference on Computation of Shells and Spatial Structures (IASS-IACM 2005), Salzburg, Austria, June 1-4, 2005.
- Technical Advisory Committee, International Conference on Coupled Problems, Santorini Island, Greece, May 25-28, 2005.
- Technical Advisory Committee, 8^{th} International Conference on Computational Plasticity (COMPLAS VIII), Barcelona, Spain, September 5-8, 2005.
- Scientific Advisory Committee, 7^{th} International Conference on Computational Structures Technology, Lisbon, Portugal, September 7-9, 2004.
- Scientific Programme Committee, 4^{th} European Conference on Computational and Applied Sciences (ECCOMAS'04) Jyväskylä, Finland, July 24-28, 2004.

- Technical Advisory Committee, International Conference on Computational Plasticity (COMPLAS VII), Barcelona, Spain, April 7-10, 2003.
- Scientific Advisory Committee, 6^{th} International Conference on Computational Structures Technology, Prague, Czech Republic, September 4-6, 2002.
- Scientific Advisory Board, First MIT Conference on Computational Solid and Fluid Mechanics, Cambridge MA, June 12-15, 2001.
- Scientific Programme Committee, 3^{rd} European Conference on Computational and Applied Sciences (ECCOMAS'00) and International Conference on Computational Plasticity (COMPLAS VI), Barcelona, Spain, September 11-14, 2000.
- Scientific Advisory Committee, 5^{th} International Conference on Computational Structures Technology, Leuven, Belgium, September 6-8, 2000.
- Technical Advisory Committee, International Conference on Computational Plasticity (COMPLAS V), Barcelona, Spain, March 17-20, 1997.

Organizer of symposia:

- "Modeling of Damage Evolution and Propagating Discontinuities at Failure," 4 sessions, 21 contributions, XI International Conference on Computational Plasticity (COMPLAS XI), Barcelona, Spain, September 7-9, 2011.
- "Dynamic Fracture," 2 sessions, 11 contributions, International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC 2011), Barcelona, Spain, June 6-8, 2011 (total of 11 contributions).
- "Numerical Techniques for the Modeling of Material Failure in Solids," 2 sessions, 11 contributions, 9^{th} World Congress on Computational Mechanics (IX WCCM), Sydney, Australia, July 19-July 23, 2010.
- "Numerical Techniques for the Modeling of Material Failure," 7 sessions, 38 contributions, 8^{th} World Congress on Computational Mechanics (VIII WCCM), Venice, Italy, June 30-July 4, 2008.
- "Numerical Techniques for the Modeling of Material Failure in Solids: Symposium in Honor of Professor Kaspar Willam on the Occasion of his 65^{th} birthday," 7 sessions, 32 contributions, 9^{th} US National Congress on Computational Mechanics (IX USNCCM), San Francisco CA, July 23-26 2007.
- "Modeling and Numerical Simulation of of Failure in Inelastic Shells and Spatial Structures," 5^{th} International Conference on Computation of Shell and Spatial Structures (IASS-IACM 2005), Salzburg, Austria, June 1-4 2005.
- "Computational Failure Mechanics at Multiple Scales," 5^{th} World Congress on Computational Mechanics (V WCCM), Vienna, Austria, July 7-12, 2002.
- "Nonlinear Solid Dynamics," 5^{th} Congress of the Spanish Society for Numerical Methods in Engineering, (SEMNI), Madrid, June 3-6, 2002.
- "Computational Failure Mechanics II," 29 contributions, 6^{th} US National Congress on Computational Mechanics (VI USCCM), Dearborn MI, August 1-4, 2001.
- "Computational Failure Mechanics," 29 contributions, 5^{th} US National Congress on

Computational Mechanics (V USCCM), Boulder, CO, August 4-6, 1999.

- "High-Performance Finite Elements in Nonlinear Solid Mechanics", 11 contributions 4^{th} World Congress on Computational Mechanics (IV WCCM), Buenos Aires, Argentina, June 29-July 2, 1998.
- "Numerical Analysis of Strain Localization", 20 contributions, 4^{th} World Congress on Computational Mechanics (IV WCCM), Buenos Aires, Argentina, June 29-July 2, 1998.
- "Computational Methods for Simulating Failure," 5 contributions, 12^{th} ASCE Engineering Mechanics Conference, La Jolla CA , May 18-20, 1998.
- "Second Symposium Recognizing the Contributions of Juan C. Simo," 30 contributions, 4^{th} US National Congress on Computational Mechanics (IV USCCM), August 6-8, 1997.
- "The Theory and Prediction of Localized Failures in Materials", 28 contributions, Joint ASCE/ASME/SES Meeting (McNU'97), Northwestern U., June 29-July 3, 1997.

Session chairman in numerous recent international conferences.

ACADEMIC ACTIVITIES:

Instructor in charge of undergraduate and graduate courses on:

- Mechanics of materials.
- Continuum and structural mechanics.
- Computational mechanics.
- Computational inelasticity.

Graduate and undergraduate student advisor.

AREAS OF RESEARCH:

Research work focuses on broad theoretical and applied aspects of computational mechanics. Specific areas include:

Computational failure mechanics: analysis of the localized failures in solids and structures, including the formulation of numerical methods based on the incorporation of discontinuities in the continuum for its resolution. Applications include:

- Infinitesimal and finite strain plasticity.
- Damage mechanics.
- Poro-plasticity of coupled porous media.
- Coupled thermomechanical models: thermoplasticity.
- Plastic and damage models of structural members: beams, rods, plates and shells.

Nonlinear dynamics: formulation, analysis and implementation of integration algorithms for the simulation of systems in nonlinear solid mechanics. Applications include:

- Nonlinear continuum elastodynamics and dynamic plasticity.
- Dynamics of nonlinear Cosserat rods.
- Dynamics of geometrically exact shell models.

Computational inelasticity: formulation, analysis and implementation of numerical algorithms for the local integration of inelastic constitutive equations. Applications include:

- Formulation and numerical analysis of continuum damage models.
- Closest-point projection algorithms for finite strain plasticity.

High-performance finite elements: formulation, analysis and implementation of new finite elements in nonlinear solid mechanics. Applications include:

- Locking-free, enhanced finite element methods for finite strain problems.
- Stabilized finite element methods for thermal transfer in plates and shells.

Arbitrary Lagrangian-Eulerian (ALE) methods: formulation, analysis and implementation of new ALE finite element methods. Applications include:

- Finite strain plasticity.
- Lagrangian fluids and fluid-structure interactions.

Coupled problems: formulation, analysis and implementation of stable monolithic and staggered algorithms for coupled problems. Applications include:

- Coupled thermomechanical problems, including finite strain thermoplasticity.
- Coupled porous media, including finite strain poroplasticity.
- MHD equations in fluid mechanics.

Integration algorithms in fluid mechanics: analysis and characterization of the long-term properties of temporal integration algorithms in computational fluid dynamics. Applications include:

- Incompressible Navier-Stokes equations.
- Incompressible MHD equations.

FUNDED RESEARCH PROJECTS:

Major extramural research projects being the only principal investigator (PI):

- "Numerical Analysis of Solids at Failure," Computational Mathematics Program, Air Force Office of Scientific Research (AFOSR), 6/1/08-5/31/11.
- "Numerical Analysis of the Dynamics of Nonlinear Solids and Structures," Computational Mathematics Program, Air Force Office of Scientific Research (AFOSR), 2/1/05-05/31/08.
- "Numerical Analysis of Failure in Solids and Structures," Computational Mechanics Program, Office of Naval Research (ONR), 5/31/03-8/31/06.
- "Integration Algorithms in Nonlinear Dynamics of Solids," Computational Mathematics Program, Air Force Office of Scientific Research (AFOSR), 9/1/00-08/31/04.
- "Finite Element Methods in Computational Failure Mechanics," Computational Mechanics Program, Office of Naval Research (ONR), 6/1/00-5/31/03, 5/31/03-8/31/06.
- "Theoretical and Numerical Analysis of Strain Localization in Directed Models of Structural Mechanics," Mechanics and Materials Program, National Science Foundation (NSF), CAREER Award, 6/1/97-5/31/02.

- "Numerical Analysis of Constrained Dynamical Systems, with Applications to Dynamic Contact of Solids and Fluid-Structure Interactions," Computational Mathematics Program, Air Force Office of Scientific Research (AFOSR), 5/1/97-8/31/01.
- "Analysis and Numerical Simulation of Strain Localization in Inelastic Solids under Fully Coupled Thermomechanical Conditions," Computational Mechanics Program, Office of Naval Research (ONR), ONR Young Investigator Award, 6/1/96-5/31/00.

LIST OF PUBLICATIONS

(F. Armero, July 2012)

ARTICLES IN ARCHIVAL PUBLICATIONS:

1. Armero, F. [2011] "Strong Discontinuities in Antiplane/Torsional Problems of Computational Failure Mechanics," *International Journal of Fracture,* accepted for publication, in press, available online DOI 10.1007/s10704-012-9695-1.

2. Bellomo, F.J.; Armero, F.; Nallim, G. and Oller, S. [2011] "A Constitutive Model for Tissue Adaptation: Necrosis and Stress Driven Growth," *Mechanics Research Communications,* accepted for publication, in press, available online doi:10.1016/j.mechrescom .2011.11.007.

3. Armero, F. and Kim, J. [2012] "Three-Dimensional Finite Elements with Embedded Strong Discontinuities to Model Material Failure in the Infinitesimal Range," *International Journal for Numerical Methods Engineering,* 91, 1291-1330.

4. Armero, F. and Valverde, J. [2012] "Invariant Hermitian Finite Elements for Thin Kirchhoff Rods. II: The Linear Three-Dimensional Case," *Computer Methods in Applied Mechanics and Engineering,* 213-216, 458-485.

5. Armero, F. and Valverde, J. [2012] "Invariant Hermitian Finite Elements for Thin Kirchhoff Rods. I: The Linear Plane Case," *Computer Methods in Applied Mechanics and Engineering,* 213-216, 427-457.

6. Bellomo, F.J.; Oller, S.; Armero, F. and Nallim, G. [2011] "A General Constitutive Model for Vascular Tissue Considering Stress Driven Growth and Biological Availability," *Computer Modeling in Engineering and Sciences,* (CMES), 80, 1-21.

7. Callari, C.; Armero, F. and Abati, A. [2010] "Strong Discontinuities in Partially Saturated Poroplastic Solids," *Computer Methods in Applied Mechanics and Engineering,* 199, 1513-1535.

8. Armero, F. and Linder, C. [2009] "Numerical Simulation of Dynamic Fracture Using Finite Elements with Embedded Discontinuities," *International Journal of Fracture,* 160, 119-141.

9. Linder, C. and Armero, F. [2009] "Finite Elements with Embedded Branching," *Finite Elements in Analysis and Design,* 45, 280-293.

10. Armero, F. and Linder, C. [2008] "New Finite Element Methods with Embedded Strong Discontinuities in the Finite Deformation Range," *Computer Methods in Applied Mechanics and Engineering,* 197, 3138-3170.

11. Armero, F. [2008] "Assumed Strain Finite Element Methods for Conserving Temporal Integrations in Nonlinear Solid Dynamics," *International Journal for Numerical Methods in Engineering,* 74, 1795-1847.

12. Linder, C. and Armero, F. [2007] "Finite Elements with Embedded Strong-Discontinuities for the Modeling of Failure of Solids," *International Journal for Numerical Methods Engineering,* 72, 1391-1433.

13. Armero, F. and Zambrana-Rojas, C. [2007] "Volume-Preserving Energy-Momentum Schemes for Isochoric Multiplicative Plasticity," *Computer Methods in Applied Mechanics and Engineering,* 196, 4130-4159.

14. Armero, F. [2006] "Energy-Dissipative Momentum-Conserving Time-Stepping Algorithms for Finite Strain Multiplicative Plasticity," *Computer Methods in Applied Mechanics and Engineering,* 195, 4862-4889.

15. Armero, F. and Ehrlich. D. [2006] "Numerical Modeling of Softening Hinges in Thin Euler-Bernoulli Beams," *Computer & Structures,* 84, 641-656.

16. Armero, F. and Ehrlich. D. [2005] "Finite Element Methods for the Multi-Scale Modeling of Softening Hinge Lines in Plates at Failure," *Computer Methods in Applied Mechanics and Engineering,* 195, 1283-1324.

17. Ehrlich, D. and Armero, F. [2005] "Finite Element Methods for the Analysis of Softening Plastic Hinges in Beams and Frames," *Computational Mechanics,* 35, 237-264.

18. Callari, C. and Armero, F. [2004] "Analysis and Numerical Simulation of Strong Discontinuities in Finite Strain Poroplasticity," *Computer Methods in Applied Mechanics and Engineering,* 193, 2941-2986.

19. Armero, F. and Ehrlich, D. [2004] "An Analysis of Strain Localization and Wave Propagation in Plastic Models of Beams at Failure," *Computer Methods in Applied Mechanics and Engineering,* 193, 3129-3171.

20. Armero, F. and Romero, I. [2003] "Energy-dissipating Momentum-Conserving Time-Stepping Algorithms for the Dynamics of Nonlinear Cosserat Rods," *Computational Mechanics,* 31, 3-26.

21. Armero, F. and Love, E. [2003] "Arbitrary Lagrangian-Eulerian Finite Element Methods for Finite Strain Plasticity," *International Journal of Numerical Methods in Engineering,* 57, 471-508.

22. Armero, F. and Park, J. [2003], "An Analysis of Strain Localization in a Shear Layer under Thermally Coupled Dynamic Conditions. Part I: Continuum Thermoplastic Models," *International Journal of Numerical Methods in Engineering,* 56, 2069-2100.

23. Armero, F. and Park, J. [2003], "An Analysis of Strain Localization in a Shear Layer under Thermally Coupled Dynamic Conditions. Part II: Localized Thermoplastic Models," *International Journal of Numerical Methods in Engineering,* 56, 2101-2133.

24. Callari, C. and Armero, F. [2002] "Finite Element Methods for the Analysis of Strong Discontinuities in Coupled Poroplastic Media," *Computer Methods in Applied Mechanics and Engineering,* 191, 4371-4400.

25. Romero, I. and Armero, F. [2002], "An Objective Finite Element Formulation of the Kinematics of Geometrically Exact Rods and its Use in the Formulation of an Energy-Momentum Conserving Scheme in Dynamics," *International Journal of Numerical Methods in Engineering,* 54, 1683-1716.

26. Romero, I. and Armero, F. [2002], "Numerical Integration of the Stiff Dynamics of Geometrically Exact Shells," *International Journal of Numerical Methods in Engineering,* 54, 1043-1086.

27. Armero, F. and Pérez-Foguet, A. [2002], "On the Formulation of Closest-Point Projection Algorithms in Elastoplasticity. Part I: The Variational Structure," *International Journal of Numerical Methods in Engineering,* 53, 297-329.

28. Pérez-Foguet, A. and Armero, F. [2002], "On the Formulation of Closest-Point Projection Algorithms in Elastoplasticity. Part II: Globally Convergent Schemes," *International Journal of Numerical Methods in Engineering,* 53, 331-374.

29. Armero, F. and Romero, I. [2001], "On the Formulation of High-Frequency Dissipative Time-Stepping Algorithms for Nonlinear Dynamics. Part II: Second Order Methods," *Computer Methods in Applied Mechanics and Engineering,* 190, 6783-6824.

30. Armero, F. and Romero, I. [2001], "On the Formulation of High-Frequency Dissipative Time-Stepping Algorithms for Nonlinear Dynamics. Part I: Low Order Methods for Two Model Problems and Nonlinear Elastodynamics," *Computer Methods in Applied Mechanics and Engineering,* 190, 2603-2649.

31. Armero, F. [2001], "On the Characterization of Localized Solutions in Inelastic Solids: An Analysis of Wave Propagation in a Softening Bar," *Computer Methods in Applied Mechanics and Engineering,* 191, 181-213.

32. Armero, F. [2000], "On the Locking and Stability of Finite Elements in Finite Deformation Plane Strain Problems," *Computers & Structures,* **75**, 261-290.

33. Armero, F. and Oller, S. [2000], "A General Framework for Continuum Damage Models. Part II: Integration Algorithms, with Applications to the Numerical Simulation of Porous Metals," *International Journal of Solids and Structures,* 37, 7437-7464.

34. Armero, F. and Oller, S. [2000], "A General Framework for Continuum Damage Models. Part I: Infinitesimal Plastic Damage Models in Stress Space," *International Journal of Solids and Structures,* 37, 7409-7436.

35. Armero, F. and Callari, C. [1999], "An Analysis of Strong Discontinuities in a Saturated Poro-Plastic Solid," *Int. J. Numerical Methods in Engineering,* 46, 1673-1698.

36. Armero, F. [1999], "Formulation and Finite Element Implementation of a Multiplicative Model of Coupled Poro-Plasticity at Finite Strains under Fully Saturated Conditions," *Computer Methods in Applied Mechanics and Engineering,* 171, 205-241.

37. Armero, F. [1999], "Large-Scale Modeling of Localized Dissipative Mechanisms in a Local Continuum: Applications to the Numerical Simulation of Strain Localization in Rate-Dependent Inelastic Models," *Mechanics of Cohesive-Frictional Materials,* 4, 101-132.

38. Armero, F. and Petocz, E. [1999], "A New Dissipative Time-Stepping Algorithm for Frictional Contact Problems: Formulation and Analysis," *Computer Methods in Applied Mechanics and Engineering,* 179, 151-178.

39. Armero, F. and Petocz, E. [1998], "Formulation and Analysis of Conserving Algorithms for Frictionless Dynamic Contact/Impact Problems," *Computer Methods in Applied Mechanics and Engineering,* 158, 269-300.

40. Glaser, S. and Armero, F. [1997], "On the Formulation of Enhanced Strain Finite Elements in Finite Deformations," *Engineering Computations,* 14, 759-791.

41. Armero, F. and Garikipati, K. [1996] "Analysis of Strong Discontinuities in Multiplicative Finite Strain Plasticity and Their Relation with the Numerical Simulation of Strain Localization in Solids," *Int. J. of Solid and Structures,* 33, 2863-2885.

42. Armero, F. and Simo, J.C. [1996] "Long-Term Dissipativity of Time-Stepping Algorithms for an Abstract Evolution Equation with Applications to the Incompressible MHD and Navier-Stokes Equations", *Computer Methods in Applied Mechanics and Engineering,* 131, 41-90.

43. Armero, F. and Simo, J.C. [1996], "Formulation of a New Class of Fractional-Step Methods for the Incompressible MHD Equations that Retains the Long-Term Dissipativity of the Continuum Dynamical System", *The Fields Institute Communications,* 10, 1-23.

44. Simo, J.C.; Armero, F. and Taylor, C.A. [1995] "Stable and Time-Dissipative Finite Element Methods for the Incompressible Navier-Stokes Equations in Advection Dominated Flows," *International Journal for Numerical Methods in Engineering,* 38, 1475-1 506.

45. Simo, J.C. and Armero, F. [1994] "Unconditional Stability and Long-Term Behavior of Transient Algorithms for the Incompressible Navier-Stokes and Euler Equations", *Computer Methods in Applied Mechanics and Engineering,* 111, 111-154.

46. Simo, J.C.; Armero, F. and Taylor, R.L. [1993] "Improved Versions of Assumed Enhanced Strain Tri-Linear Elements for 3D Finite Deformation Problems", *Computer Methods in Applied Mechanics and Engineering,* 110, 359-386.

47. Simo, J.C.; Oliver, J. and Armero, F. [1993] "An analysis of Strong Discontinuities Induced by Strain-Softening in Rate-Independent Inelastic Solids", *Journal of Computational Mechanics,* 12, 277-296.

48. Armero, F. and Simo, J.C. [1993] "A-Priori Stability Estimates and Unconditionally Stable Product Formula Algorithms for Non-Linear Coupled Thermoplasticity", *International Journal of Plasticity,* 9, 149-182.

49. Armero, F. and Simo, J.C. [1992] "A New Unconditionally Stable Fractional Step Method for Non-Linear Coupled Thermomechanical Problems", *International Journal for Numerical Methods in Engineering,* 35, 737-766.

50. Simo, J.C. and Armero, F. [1992] "Geometrically Non-Linear Enhanced Strain Mixed Methods and the Method of Incompatible Modes", *International Journal for Numerical Methods in Engineering,* 33, 1413-1449.

BOOK CONTRIBUTIONS (REFEREED):

1. Armero, F. [2009] "Energy-Momentum Algorithms for Nonlinear Solid Dynamics and their Assumed Strain Finite Element Formulation," Computational Structural Dynamics and Earthquake Engineering, ed. M. Papadrakakis et al, CRC Press/Balkema, Taylor & Francis, Leiden. (also Proc. COMPDYN07, Rethymno, Greece).

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[1] Some of the reports listed next were submitted to a technical journal. A revised version appears then published years later upon acceptance. These reports have been marked with an $*$ in the list that follows.

2. Armero, F. [2008] "Energy-Momentum Algorithms for Nonlinear Coupled Thermo-Elasticity," Report no. UCB/SEMM-2008/03, University of California at Berkeley

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1. Armero, F. [2001] "Cosserat theories: shells, rods and points" by M.B. Rubin, *AIAA Journal,* 39, 981-983.

LIST OF RECENT SEMINARS, INVITED LECTURES AND CONFERENCE CONTRIBUTIONS

(F. Armero, July 2012)

INVITED LECTURES AND OTHER CONFERENCE CONTRIBUTIONS:

1. "Invariant Finite Elements for Thin Kirchhoff Rods," invited contribution, Trends & Challenges in Computational Mechanics (TCCM 2011), Padua, Italy, September 12-14 2011.

2. "Finite Element Analysis of Failure in Solids and Structures," plenary lecture, XI International Conference on Computational Plasticity (COMPLAS XI), Barcelona, Spain, September 7-9 2011.

3. "Finite Elements with Embedded Strong Discontinuities in Computational Failure Mechanics," plenary lecture, VIII Colombian Congress on Numerical Methods (8CCMN-2011), Medellin, Colombia, August 10-12 2011.

4. "Finite Elements with Embedded Strong Discontinuities for Computational Fracture," plenary lecture, International Conference on Computational Modeling of Fracture and Failure (CFRAC 2011), Barcelona, Spain, June 6-8 2011.

5. "Progress in the Formulation of Finite Elements with Embedded Discontinuities to Model Failure in Solids," invited contribution, 10^{th} International Conference on Computational Structures Technology (CST2010), ed by B.H.V. Topping et al, Valencia, Spain, September 14-17, 2010.

6. "A Biological Growth Model for Soft Tissue Under Stress Driven and Biological Availability," invited contribution, 9^{th} World Congress on Computational Mechanics (WCCM 9), Sydney, Australia, July 19-23 2010.

7. "Advances in Finite Elements with Embedded Discontinuities for the Modeling of Material Failure," invited contribution, 9^{th} World Congress on Computational Mechanics (WCCM 9), Sydney, Australia, July 19-23 2010.

8. "Strong Discontinuties in Partially Saturated Media at Failure," invited contribution, 16^{th} US National Congress of Theoretical and Applied Mechanics (USNCTAM 2010), Penn State, State College PA, June 27-July 2 2010.

9. "Finite Elements for Kirchhoff Rods," IV European Conference on Computational Mechanics (ECCM 2010), ECCOMAS, Paris, France, May 16-21 2010.

10. "Finite Elements with Embedded Strong Discontinuities for the Modeling of Failure in Solids," plenary lecture, GTO10, Congress of the Mexican Association of Computational Mechanics, Guanajuato, Mexico, February 2-5, 2010.

11. "Finite Elements with Embedded Strong Discontinuities and Branching for Modeling Failure," plenary lecture, X International Conference on Computational Plasticity (COMPLAS 10), Barcelona, Spain, September 2-4 2010.

12. "Finite Elements for Kirchhoff Rods," Congress on Numerical Methods in Engineering (METNUM 2009), SEMNI/APMTAC, Barcelona, Spain, June 22-July 2 2009.

13. "Numerical Modeling of Dynamic Fracture," keynote lecture, 2^{nd} International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN 2009), Rhodes, Greece, June 22-24 2009.

14. "Finite Elements with Embedded Strong Discontinuities and Branching for the Modeling of Failure in Solids," plenary lecture, ENIEF08, Congress of the Argentinian Association of Computational Mechanics, San Luis, Argentina, November 10-13, 2008.

15. "Energy-Momentum Algorithms for Nonlinear Coupled Thermo-Elastodynamics," invited keynote lecture, 8^{th} World Congress on Computational Mechanics (WCCM 8), Venice, Italy, June 30-July 4 2008.

16. "Modeling of Dynamic Fracture using Finite Elements with Embedded Strong Discontinuities," invited contribution, 8^{th} World Congress on Computational Mechanics (WCCM 8), Venice, Italy, June 30-July 4 2008.

17. "Analysis of Strong Discontinuities in Partially Saturated Poroplastic Solids," invited contribution, 8^{th} World Congress on Computational Mechanics (WCCM 8), Venice, Italy, June 30-July 4 2008.

18. "Finite Element Modeling of Kirchhoff Rods," invited contribution, 6^{th} International Conference on Computation of Shell and Spatial Structures (IASS-IACM 2008), Cornell University, Ithaca, NY, May 28-31 2008.

19. "Energy-Momentum Algorithms for Nonlinear Dynamics of Elastoplastic Solids," invited contribution, IUTAM Symposium on Theoretical, Modeling and Computational Aspects of Inelastic Media, Cape Town, South Africa, January 14-18 2008.

20. "Finite Elements with Embedded Discontinuities and Dynamic Fracture," invited contribution, IX International Conference on Computational Plasticity (COMPLAS 9), Barcelona, Spain, September 5-7 2007.

21. "New Finite Elements with Embedded Strong Discontinuities in the Finite Deformation Range," invited contribution, 9^{th} US National Congress on Computational Mechanics (USNCCM 9), San Francisco, CA, July 23-26, 2007.

22. "Strong Discontinuities in Coupled Multiphase Poro-Plastic Media," invited contribution, 9^{th} US National Congress on Computational Mechanics (USNCCM 9), San Francisco, CA, July 23-26, 2007.

23. "Dynamic Fracture Using Finite Elements Enhanced with Cohesive Discontinuities," 9^{th} US National Congress on Computational Mechanics (USNCCM 9), San Francisco, CA, July 23-26, 2007.

24. "Energy-Momentum Algorithms for Nonlinear Solid Dynamics and their Assumed Strain Finite Element Formulation," invited semi-plenary lecture, Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN07), Rethymno, Greece, June 13-16 2007.

25. "Recent Developments in the Formulation of Finite Elements with Embedded Strong Discontinuities," invited contribution, IUTAM Symposium on Discretization Methods for Evolving Discontinuities, Lyon, France, September 4-7 2006.

26. "Energy-Momentum Schemes for Finite Strain Plasticity," keynote lecture, 7^{th} World Congress on Computational Mechanics (WCCM 7), Los Angeles CA, July 17-21 2006.

27. "Finite Elements with Embedded Strong Discontinuities of Higher Order Kinematics," invited contribution, 7^{th} World Congress on Computational Mechanics (WCCM 7), Los Angeles CA, July 17-21 2006.

28. "Numerical Integration of the Nonlinear Dynamics of Elastoplastic Solids," keynote lecture, 3^{rd} European Conference on Computational Mechanics (ECCM 3), Lisbon, Portugal, June 5-9 2006.

29. "Energy-Dissipative Momentum-Conserving Time-Stepping Algorithms for Dynamic Plastic Finite Strain Plasticity," invited contribution, VIII International Conference on Computational Plasticity (COMPLAS 8), Barcelona, Spain, September 4-6 2005.

30. "Finite Element Modeling of Cracks and Softening Hinges in Plates and Shells," 8^{th} USNCCM, Austin, TX, July 25-27, 2005.

31. "Nonlinear Geometric Effects on the Localized Failure of Poroplastic Solids," invited contribution, 3^{rd} International Conference on Structural Stability and Dynamics, Kissimmee, FL, June 19-22, 2005.

32. "Modelo y Simulación Numérica de Discontinuidades Fuertes en Láminas," invited contribution, Congreso de Métodos Numéricos en Ingeniería SEMNI 2005 (Congress on Numerical Methods in Engineering), Granada, Spain.

33. "Finite Element Modeling of Strong Discontinuities in Shells at Failure," keynote lecture, 5^{th} International Conference on Computation of Shell and Spatial Structures, Salzburg, Austria, June 1-4 2005.

34. "Finite Element Methods for the Analysis of Strong Discontinuities in Plates at Failure," invited keynote lecture, XI International Conference on Fracture (ICF11), Torino, Italy, March 20-25, 2005.

35. "Enhanced Finite Elements for Discontinuous Solutions in Solids and Structures at Failure," invited lecture, Workshop on Mixed and Non-Standard Finite Elements with Applications, Mathematics Institute at Oberwolfach, Germany, January 31-February 4, 2005.

36. "On the Modeling of Localized Failures in Saturated Porous Media through Strong Discontinuities," invited keynote lecture, 6^{th} World Congress on Computational Mechanics (WCCM6), Beijing, China, September 5-11, 2004.

37. "Localization in Saturated Media Subject to Large Deformations," Incotro Annuale dei Recircatori di Geotecnia IARG 2004, Trento, Italy, July 7-9 2004.

38. "On the Modeling of Strong Discontinuities in Inelastic Solids at Failure," invited keynote lecture, Advances in Computational Mechanics, Rice University, Houston TX, April 7-9, 2004.

39. "Finite Element Approximation of Plastic Hinges in Beams and Plates," invited keynote lecture, 7^{th} USNCCM, Albuquerque, NM, July 28-30, 2003.

40. "On the Geometric Structure of the Nonlinear Dynamics of Finite Element Models of Elastic Solids and Structures," invited lecture, 7^{th} USNCCM, Albuquerque, NM, July 28-30, 2003.

41. "Finite Element Methods for the Analysis of Plastic Hinges in Beams and Rods," invited plenary address, VII International Conference on Computational Plasticity (COMPLAS 7), Barcelona, Spain, April 7-10, 2003.

42. "On the Temporal Integration in Nonlinear Solid Dynamics," invited keynote plenary address, First South American Congress on Computational Mechanics MECOM'02, Santa Fe-Parana, Argentina, October 28-31, 2002.

43. "Conserving/Dissipative Algorithms for the Nonlinear Dynamics of Elastic Solids and Structures," invited keynote lecture, Foundations of Computational Mathematics, FoCM'02, University of Minnesota, Minneapolis, August 5-14, 2002.

44. "An Analysis of Localized Failures in Structural Members and its Modeling through Plastic Hinges: Plastic Beams and Rods," invited lecture, V World Congress on Computational Mechanics (V WCCM), Vienna, Austria, July 7-12, 2002.

45. "On the Strain Localization in Thermally Coupled Problems and its Resolution through Strong Discontinuities," invited lecture, 5^{th} Congress of the Spanish Society for Numerical Methods in Engineering, (SEMNI), Madrid, June 3-6, 2002.

46. "Conserving/Dissipating Algorithms for the Temporal for the Nonlinear Dynamics of Solids," invited lecture, 5^{th} Congress of the Spanish Society for Numerical Methods in Engineering, (SEMNI), Madrid, June 3-6, 2002.

47. "An Analysis of Strain Localization under Coupled Thermomechanical Conditions," invited lecture, 6^{th} USNCCM, Dearborn, MI, August 1-3, 2001.

48. "An Energy-Momentum Conserving Algorithm for the Nonlinear Dynamics of Three-Dimensional Rods," invited lecture, 6^{th} USNCCM, Dearborn, MI, August 1-3, 2001.

49. "Stabilized Finite Element Methods for the Analysis of Heat Transfer in Shells," invited lecture, 6^{th} , Dearborn, MI, August 1-3, 2001.

50. "An ALE Finite Element Method in Finite Strain Plasticity," European Conference on Computational Mechanics ECCM'01, Cracow, Poland, June 26-29, 2001.

51. "Stabilized Finite Element Methods for the Analysis of Heat Transfer in Shells," invited lecture, European Conference on Computational Mechanics ECCM'01, Cracow, Poland, June 26-29, 2001.

52. "On the Objective and Conserving Integration of Geometrically Exact Rod Models," invited lecture, Trends in Computational Structural Mechanics, Lake Constance, Austria, May 20-23, 2001.

53. "A method of Strong Discontinuities for the Analysis of Strain Localization in Saurated Poro-Plastic Media," XIII Convegno Italiano di Meccanica Computazionale, Brescia, November 13-15, 2000.

54. "High-Frequency Dissipative Algorithms for Nonlinear Shells," invited contribution, ECCOMAS 2000, Barcelona, Spain, September 11-14, 2000.

55. "Globally Convergent Closest-Point Projection Algorithms in Elastoplasticity," ECCOMAS 2000, Barcelona, Spain, September 11-14, 2000.

56. "A Strong Discontinuity Approach for the Analysis and Numerical Simulation Strain Localization in Saturated Poro-Plastic Media," Mathematical Models in Soil Mechanics, Scilla di Reggio Calabria, Italy, September 19-22, 2000.

57. "Dissipative Integration Algorithms for Nonlinear Elastodynamics," keynote lecture, European Conference on Computational Mechanics ECCM'99, Munich, Germany, September 1999.

58. "A New Framework for the Development of Damage Models at Large Strains," invited contribution, European Conference on Computational Mechanics ECCM'99, Munich, Germany, September 1999.

59. "A General Framework for Damage Theories and its Application to the Numerical Simulation of Failure," invited contribution, V US Congress on Computational Mechanics, Boulder CO, August 1999.

60. "On the Formulation of Dissipative Time-Stepping Algorithms for Nonlinear Elastodynamics," invited contribution, V US Congress on Computational Mechanics, Boulder CO, August 1999.

61. "On the Temporal Integration of Nonlinear Dynamic Problems," keynote address, 4^{th} Congress of the Spanish Society for Numerical Methods in Engineering, (SEMNI), Sevilla, June 7-10, 1999.

62. "On the Numerical Analysis of Dynamic Contact/Impact of Nonlinear Elastic Multi-Body Systems," invited contribution, 5^{th} SIAM Conference of Applications of Dynamical Systems, Snowbird, May 23-27, 1999.

63. "On the Formulation of High-Frequency Dissipative Time-Stepping Algorithms for Nonlinear Dynamics," invited contribution, 5^{th} SIAM Conference of Applications of Dynamical Systems, Snowbird, May 23-27, 1999.

64. "Integration Algorithms for Nonlinear Dynamics," invited plenary lecture, Mathematische Analyse von FEM fr Probleme in der Mechanik, Oberwolfach, Germany, February 6-12, 1999.

65. "Stable Simulation of Dynamic Multi-Body Elastic Systems," Keynote Lecture, IV World Congress on Computational Mechanics, Buenos Aires, Argentina, June 29-July 2, 1998.

66. "Strong Discontinuities in Fully Saturated Porous Media," invited contribution, IV World Congress on Computational Mechanics, Buenos Aires, Argentina, June 29-July 2, 1998.

67. "Formulation and Numerical Simulation of Anisotropic Damage at Finite Strains," invited contribution, IV World Congress on Computational Mechanics, Buenos Aires, Argentina, June 29-July 2, 1998.

68. "On the Stability of Finite Element Formulations in Finite Deformation Elastoplasticity," invited contribution, IV World Congress on Computational Mechanics, Buenos Aires, Argentina, June 29-July 2, 1998.

69. "Numerical Simulation of Anisotropic Damage at Finite Strains," invited contribution, 12^{th} ASCE Engineering Mechanics Conference, La Jolla, May 18-20, 1998.

70. "Analysis and Numerical Simulation of Disocntinuous Solutions in Inelastic Solids under Dynamic Conditions," invited contribution, 1997 ASME International Mechanical Engineering Congress and Exposition, Dallas, November 16-21, 1997.

71. "Sobre el Análisis de la Localización de Deformaciones en Sólidos Inelásticos," Keynote Address, XVIII Latin-American Conference of Computational Methods in Engineering (XVIII CILAMCE), Brasilia, Brasil, October 27-29 1997.

72. "Some Results on the Formulation of Enhanced Strain Finite Elements for Finite Deformation Elastoplastic Problems," invited plenary lecture, Euromech Colloquium 371, Bad Herrenalb, Germany, September 17-19 1997.

73. "Formulation and Numerical Analysis of a Coupled Model of the Fluid Flow in a Nonlinear Porous Solid," invited contribution, 4^{th} US Congress on Computational Mechanics, San Francisco CA, August 6-8 1997.

74. "Conserving Algorithms for Frictionless Dynamic Contact Problems," 4^{th} US Congress on Computational Mechanics, San Francisco CA, August 6-8 1997.

75. "Formulation and Numerical Simulation of a Localized Mixed Mode Damage Model" 4^{th} US Congress on Computational Mechanics, San Francisco CA, August 6-8 1997.

76. "On the Theoretical and Numerical Characterization of Discontinuous Solutions in Inelastic Solids," invited contribution, McNU'97, Joint Summer Meeting of ASCE-ASME-SES, Northwestern University, June 29 to July 2 1997.

77. "On the Formulation of Stable Time-Stepping Algorithms for Contact Problems," invited contribution, Fifth Int. Computational Plasticity Conf., COMPLAS V, Barcelona, Spain, March 17-20 1997.

78. "Localized Anisotropic Damage of Brittle Materials," invited contribution, Fifth Int. Computational Plasticity Conf., COMPLAS V, Barcelona, Spain, March 17-20 1997.

79. "A New Class of Conserving Algorithms for Dynamic Contact Problems," Numerical Methods in Engineering, ECCOMAS'96, Paris, September 9-13 1996.

80. "Enhanced Strain Finite Element Methods for Finite Deformation Problems," III Congress of SEMMI, Zaragoza, Spain, June 3-6 1996.

81. "An Analysis of Strong-Discontinuities in Inelastic Solids with Applications to the Finite Element Simulation of Strain Localization Problems," invited contribution, 11^{th} ASCE Engineering Mechanics Conf., Fort Lauderdale, May 19-22 1996.

82. "Numerical Analysis of Strong Discontinuities in Inelastic Solids at Finite Strains," invited contribution, 4^{th} US Congress on Computational Mechanics, Dallas, Texas, June 12-14 1995.

83. "Numerical Integration of Strongly Coupled Field Equations in Solids," 4^{th} US Congress on Computational Mechanics, Dallas, Texas, June 12-14 1995.

84. "Recent Advances in the Analysis and Numerical Simulation of Strain Localization in Inelastic Solids," Fourth Int. Computational Plasticity Conf., COMPLAS IV, ed. by D.R.J Owen, E. Onate and E. Hinton, Barcelona, 1995.

85. "Long-Term Dissipative Behavior of Time-Stepping Algorithms for the Incompressible Navier-Stokes and MHD Equations", invited lecture, Workshop on Integration Algorithms for Classical Mechanics, The Fields Institute for Research in Mathematical Sciences, Waterloo, Ontario, Canada, Nov. 14-17, 1993.

(Additional older contributions available upon request)

INVITED SEMINARS:

1. "Finite Elements with Embedded Strong Discontinuities for the Modeling of Failure in Solids," invited seminar, Department of Structural Mechanics, Universita' di Pavia, Italy, November 10 2011.

2. "Finite Element Methods in Nonlinear Solid and Structural Dynamics," invited lecture, International Center of Numerical Methods in Engineering (CIMNE), Polytechnical University of Barcelona, Spain, May 16 2011.

3. "Finite Elements with Embedded Strong Discontinuities for the Modeling of Failure in Solids," invited seminar, Department of Civil and Environmental Engineering, Duke University, April 29 2011.

4. "Elementos Finitos con Discontinuidades Fuertes para el Análisi del Fallo Material en Sólidos," invited seminar, Instituto Tecnológico and Universidad de Buenos Aires, Buenos Aires, Argentina, November 11 2010.

5. "Finite Elements with Embedded Strong Discontinuities for the Modeling of Failure in Solids," invited seminar, Department of Civil and Environmental Engineering, Vanderbilt University, Nashville TN, February 15 2010.

6. "Finite Elements with Embedded Strong Discontinuities for the Modeling of Failure in Solids," invited seminar, Department of Materials Science and Engineering, University of North Texas, Denton TX, October 2 2009.

7. "Finite Elements with Embedded Strong Discontinuities and Branching for the Modeling of Failure in Solids," invited seminar, Department of Mechanical Engineering, Universidad de Zaragoza, Spain, March 27 2009.

8. "Finite Elements with Embedded Strong Discontinuities and Branching for the Modeling of Failure in Solids," invited seminar, Department of Mechanical Engineering, Universidad Politécnica de Madrid, Spain, March 25 2009.

9. "Energy-Momentum Algorithms for the Nonlinear Dynamics of Elastoplastic Solids," invited seminar, Department of Mechanical Engineering, Universidad de Sevilla, Spain, March 24 2009.

10. "Energy-Momentum Algorithms for the Nonlinear Dynamics of Elastoplastic Solids," invited seminar, Department of Civil Engineering, Universidad de Granada, Spain, March 23 2009.

11. "Energy-Momentum Algorithms for the Dynamics of Nonlinear Solids and Structures," invited seminar, Department of Civil and Environmental Engineering, Facultad de Ingeniería, Universidad Nacional de Cuyo, Mendoza, Argentina, November 14 2008.

12. "Energy-Momentum Algorithms for Finite Strain Plasticity," invited seminar, Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, September 29 2008.

13. "Progress in the Formulation of Energy-Momentum Schemes for Nonlinear Solid and Structural Dynamics," invited seminar, School of Civil Engineering, Universitat Politècnica de Catalunya, Barcelona, Spain, July 21 2008

14. "Numerical Integration in Nonlinear Solid and Structural Dynamics," invited seminar, Department of Civil and Environmental Engineering, Johns Hopkins University, December 17 2007.

15. "Numerical Integration of the Nonlinear Dynamics of Inelastic Solids and Structures," invited seminar, Department of Civil and Environmental Engineering, University of California at Los Angeles (UCLA), February 14 2006.

16. "Modeling of Strong Discontinuities in Solids at Failure," invited seminar, Department of Aerospace and Mechanical Engineering, University of Southern California, May 12, 2005.

17. "Numerical Integration of the Nonlinear Dynamics of Solids and Structures," invited seminar, Department of Aerospace and Mechanical Engineering, University of Southern California, January 20, 2005.

18. "Computational Dynamics of Nonlinear Elastic Shells," invited seminar, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, October 31, 2003.

19. "On the Numerical Integration of the Dynamics of Nonlinear Elastic Solids and Structures," invited lecture, Department of Mechanical Engineering, Northwestern University, February 28, 2003.

20. "On the Numerical Integration of the Dynamics of Geometrically Exact Models of Rods and Shells, Computational Mechanics Seminar," invited lecture, CIMNE, Barcelona, Spain, April 6, 2001.

21. "Analysis and Numerical Simulation of Strain Localization in Inelastic Solids: the Strong Discontinuity Approach," invited lecture, Graduate Engineering and Research Institute, University of Florida, Eglin AFB, July 12 2000.

22. "Stable Simulation of Dynamic Contact in Multi-Body Elastic Systems," invited lecture, Graduate Engineering and Research Institute, University of Florida, Eglin AFB, July 13 2000.

23. "Integration Algorithms for Nonlinear Elastodynamics," invited lecture, Solid Mechanics Seminar, Division of Mechanics and Computation, Stanford University, February 3, 1999.

24. "On the Locking and Stability of Finite Elements," invited lecture, Applied Mathematics Seminar, Universitat Politecnica de Catalunya, Barcelona, Spain, July 5, 1999.

25. "Numerical Analysis of Strain Localization Problem," invited lecture, Computational Mechanics Seminar, Universidad de Buenos Aires, Argentina, June 5, 1997.

26. "Formulation and Numerical Analysis of Continuum Models with a Localized Damage Mechanism," invited lecture, Civil Engineering Seminar, Universidad Nacional de Tucuman, Tucuman, Argentina, June 3, 1997.

27. "On the Formulation of Enhanced Strain Finite Elements," invited lecture, Civil Engineering Seminar, Universidad Nacional de Tucuman, Tucuman, Argentina, June 2, 1997.

28. "On the Formulation and Numerical Analysis of Constitutive Models of Solids that Exhibit a Localized Dissipative Mechanism," invited lecture, Civil Engineering Seminar, California Institute of Technology, May 15, 1997.

29. "On the Enhanced Strain Finite Element Methods," invited lecture, Mechanical Engineering Seminar, ITT, Universidad Pontificia de Comillas, Madrid, Spain, June 17, 1996.

30. "Recent Advances in the Formulation of Finite Element Methods For Nonlinear Solid Mechanics," invited lecture, Civil Engineering Seminar, Department of Civil Engineering, University of California at Berkeley, April 29, 1994.

31. "Stability and Asymptotic Long-Term Behavior of Time-Stepping Algorithms for the Incompressible Navier-Stokes and MHD Equations," invited lecture, Department of Mathematics, Stanford University, June 4, 1993.

32. "On the Numerical Analysis of Nonlinear Coupled Thermomechanical Problems in Solid Mechanics," invited lecture, Civil Engineering Seminar, Department of Civil Engineering, University of California at Berkeley, April 29, 1993.

33. "Geometrically Non-Linear Enhanced Strain Methods and the Method of Incompatible Modes", invited lecture, Lawrence Livermore Laboratory, CA, August 23, 1991.

SHORT TECHNICAL COURSES:

1. "Finite Element Locking and the Enhanced Strain Formulation," CISM course on Mixed Finite Element Technologies, CISM Udine, Italy, September 26-30, 2005.

2. "Finite Element Methods in Nonlinear Problems," 16 hour course offered at the Universidad Nacional del Cuyo, Mendoza, Argentina, May 26-30, 1997.

PRESENTATIONS IN CONTRACTOR'S MEETINGS AND WORKSHOPS:

1. "Numerical Analysis of Solids at Failure: A Progress Report," AFOSR Computational and Physical Mathematics Program Workshop, Arlington, VA, July 27-30, 2010.

2. "Numerical Analysis of Solids at Failure," AFOSR Computational and Physical Mathematics Program Workshop, Arlington, VA, July 29-31, 2009.

3. "Numerical Analysis of the Dynamics of Nonlienar Solids and Structures," AFOSR Computational and Physical Mathematics Program Workshop, Arlington, VA, August 13-15, 2008.

4. "Joint Session on Numerical Methods," plenary presentation, AFOSR Computational and Physical Mathematics Program Workshop, Long Beach, CA, August 6-9, 2007.

5. "Numerical Analysis of the Dynamics of Nonlienar Solids and Structures," AFOSR Computational and Physical Mathematics Program Workshop, Long Beach, CA, August 6-9, 2007.

6. "Numerical Analysis of the Dynamics of Nonlienar Solids and Structures," AFOSR Computational and Physical Mathematics Program Workshop, Atlanta GA, August 7-10, 2006.

7. "Finite Element Methods in Computational Failure Mechanics: A Progress Report," ONR Computational Mechanics Program Workshop, Arlington VA, April 24-26, 2006.

8. "Numerical Analysis of the Dynamics of Nonlienar Solids and Structures," AFOSR Computational and Physical Mathematics Program Workshop, Long Beach, CA, August 29-September 1, 2005.

9. "Finite Element Methods in Computational Failure Mechanics: A Progress Report," ONR Computational Mechanics Program Workshop, Arlington VA, April 18-20, 2005.

10. "Integration Algorithms for Nonlinear Dynamics of Solids," AFOSR Computational and Physical Mathematics Program Workshop, AFRL Wright Patterson AFB, Dayton OH, June 14-15, 2004.

11. "Finite Element Methods in Computational Failure Mechanics: A Progress Report," ONR Computational Mechanics Program Workshop, Arlington VA, April 19-12, 2004.

12. "Integration Algorithms for Nonlinear Dynamics of Solids: Numerical Analysis of Relative Equilibria," AFOSR Computational and Physical Mathematics Program Workshop, GERC University of Florida and AFRL Research Institute for Autonomous Precision Guided Systems, Eglin AFB, May 29-30, 2003.

13. "Finite Element Methods in Computational Failure Mechanics: A Progress Report," ONR Computational Mechanics Program Workshop, Arlington VA, April 7-10, 2003.

14. "Integration Algorithms for Nonlinear Dynamics of Solids: A Progress Report," AFOSR Computational and Physical Mathematics Program Workshop, GERC University of Florida and AFRL Research Institute for Autonomous Precision Guided Systems, Eglin AFB, May 29-31, 2002.

15. "Finite Element Methods in Computational Failure Mechanics: A Progress Report," ONR Computational Mechanics Program Workshop, Arlington VA, April 15-18, 2002.

16. "Integration Algorithms for Nonlinear Dynamics of Solids: A Progress Report," AFOSR Computational and Physical Mathematics Program Workshop, Stanford University, Stanford, CA, July 25-27, 2001.

17. "Finite Element Methods in Computational Failure Mechanics: A Progress Report," ONR Computational Mechanics Program Workshop, Arlington VA, April 23-26, 2001.

18. "Computational Challenges and Issues: a Research Plan on Material Modeling and Failure," Invitational Workshop on Innovative Computational Approaches to Air Force Problems, GERC University of Florida and AFRL Research Institute for Autonomous Precision Guided Systems, Eglin AFB, September 28-29 2000.

19. "Integration Algorithms for Nonlinear Dynamics of Solids and Fluid-Solid Interactions," AFOSR Computational and Physical Mathematics Program Workshop, Stanford University, Stanford, CA, June 28-30, 2000.

20. "Computational Methods for the Analysis of Failure in Inelastic Solids," ONR Computational Mechanics Program Workshop, Arlington VA, May 22-25, 2000.

21. "Integration Algorithms for Nonlinear Dynamics," AFOSR Computational and Physical Mathematics Program Workshop, Washington University, St. Louis, MI, August 9-11, 1999.

22. "Localized Failure of Inelastic Solids: Analysis and Numerical Resolution," ONR Solid Mechanics Program Workshop, Naval Surface Warfare Center, Carderock MD, April 28-30, 1999.

23. "Analysis and Numerical Simulation of Localized Failures in Inelastic Solids," ONR Computational Mechanics Program Workshop, Boulder CO, January 4-6, 1999.

24. "Stable Numerical Methods for the Simulation of Dynamic Multi-Body Elastic Systems," AFOSR Computational and Physical Mathematics Program Workshop, Wright Laboratory, Wright-Patterson AFB, Dayton OH, July 20-22, 1998.

25. "On the Characterization and Numerical Simulation of Localized Dissipative Mechanisms in Inelastic Solids," ONR Computational Mechanics Program Review, San Diego CA, January 27-29, 1998.

26. "Numerical Analysis of Strain Localization in Inelastic Solids," ONR Computational Mechanics Program Review, The University of Texas, Austin, Texas, February 18-21, 1997.

27. "Numerical Analysis and Simulation of Dynamical Systems in Nonlinear Solid Mechanics," AFOSR Computational and Physical Mathematics Program Review, Wright Laboratory, Wright-Patterson AFB, Dayton OH, June 24-26 1996.

28. "Computational Methods for Infinite Dimensional Dynamical Systems. Applications to Flexible Structures and Incompressible Fluids," AFOSR Computational and Physical Mathematics Program Review, Philips Laboratory, Kurtland AFB, Albuquerque, New Mexico, June 28-30, 1995.