A. Plenary Conference Lectures


4. Recent progress in constitutive relations for concrete creep, Int. Conf. on Fundamental Research in Creep and Shrinkage in Concrete, Lausanne, Sept. 16, 1980, Principal Lecture.


15. Determination of Nonlinear fracture characteristics and time dependence from size effect (co-author: R. Gettu), Int. Conf. on "Recent Developments on the Fracture of Concrete and Rocks", Keynote Lecture, University of Wales, Cardiff, September 22, 1989.


17. Recent advances in failure localization and nonlocal models, Int. Conf. on Micromechanics of Failure of Quasi-Brittle Materials, Albuquerque (Hilton), June 6, 1990.


24. Recent advances in fracture mechanics, size effect and rate dependence of concrete-implications for dams. Plenary Lecture, International Workshop on Dam Frac-
ture and Damage, Chambéry, France, March 16, 1994.


27. Fracture characteristics and micromechanical theory of rock as a quasibrittle material: Apercu of recent advances, Plenary Keynote Lecture, 5th Int. Symp. on Rock Fragmentation by Blasting (FRAGBLAST 5), Montreal, Aug. 26, 1996.


31. Modeling of concrete behavior: state-of-the-art. Plenary Lecture (one of four), 14th Int. Conf. on Structural Mechanics in Reactor Technology (SMiRT 14), Lyon, August 20, 1997.


35. Size effect in tensile and compression fracture of concrete structures: computational modeling and design. 3rd Inter. Conf. on Fracture Mechanics of Concrete Structures (FraMCoS-3), Plenary Lecture, Gifu, Japan


41. Probabilistic modeling of quasibrittle fracture and size effect. Plenary Keynote Lecture. 8th Int. Conf. on Structural Safety and Reliability (ICOSSAR). Newport Beach (Marriott), California, June 20, 2001.


49. Durability modeling based on fracture, diffusion, chemomechanics and creep: Recent advances (plenary opening lecture). CONSECC’04 (4th Int. Conf. on Concrete under Severe Conditions: Environment and Loading), Seoul (Lotte Hotel - Jamsil), Korea, June 28, 2004.


51. Concrete creep at high temperature and its interaction with fracture: Recent progress (co-author G. Cusatis). Plenary Lecture. 7th Int. Conf. on Creep, Shrinkage and Durability of Concrete and Concrete Struc-
tures (Concreep 7), Ecole Centrale de Nantes, France, Sept. 13, 2005.


54. Computational structural reliability—a major challenge and opportunity for concrete and other quasi-brittle materials (co-author S. Pang), Plenary Keynote Lecture, Conf. on Computational Modelling of Concrete Structures (EURO-C 2006), Mayrhofen, Austria, March 30, 2006.


56. Energetic-probabilistic size effect on structural strength, Plenary Lecture, 16th European Conf. on Fracture (ECF 16), Alexandroupolis, Greece, July 3, 2006.

57. Size and geometry effects on required safety factors for composites with softening damage. Plenary Opening Lecture, Int. Conf. on Damage in Composite Material: Nondestructive Testing and Simulation (B. Kröplin, chair), Stuttgart University, Germany, Sept. 18, 2006.


59. Microplane and random lattice models for damage and fracture of heterogeneous quasi-brittle materials, Keynote (plenary opening) lecture, DoD-DoT Workshop on Modeling Concrete under High Impulsive Loadings (Kent Danielson, organizer), Institute for Advanced Technology, University of Texas, Austin, TX, March 20, 2007.


63. Consequences of ignoring or misjudging the size effect in concrete design codes and practice. Plenary opening lecture. 1st Annual Convention of Taiwan Concrete Institute (TCI), Nov. 2, 2007, Taipei, Taiwan.

64. Consequences of ignoring or mis-judging the size effect in concrete design codes and practice. Plenary lecture. 3rd Structural Engineers World Congress, Nov. 5, 2007, Grand Ashok Hotel, Bangalore, India.

65. Size effect of probability of quasi-brittle failure and lifetime: from atomistic to structural scale. Opening Principal Lecture, Int. Conf. on “Physical Aspects of Fracture Scaling and Size Effects”, org. by ETH Zürich, March 10, 2008, Monte Verità, Ascona, Switzerland.


68. Prediction of creep and shrinkage and their effects in concrete structures: critical appraisal (with G.-H. Li and Q. Yu). Opening Plenary Lecture. 8th Int. Conf. on Creep, Shrinkage and Durability of Concrete and Concrete Structures (CONCREEP-8), Ise-Shima, Japan, Sept. 30, 2008.


70. Scaling of strength of fiber composite structures (1 of 2 principal plenary lectures), 2nd ECCOMAS Thematic Conference on Mechanical Response of Composites, Imperial College, London, April 2, 2009.

71. Lessons from excessive long-time deflections and collapse of record-span segmental box girder bridge in Palau (plenary lecture), Korea Concrete Institute, Spring Convention, Busan, Korea, May 7, 2009.


74. Modeling of concrete creep and hygrothermal deformations, and computation of their structural effects. Opening Plenary Lecture. EURO-C (Computational Modeling of Concrete Structures), Rohrmos/Schladming, Austria, March 15, 2010.

75. Statistical aspects of quasi-brittle size effect and lifetime, with consequences for safety and durability of large structures. Opening Plenary Lecture. 7-th Intern. Conf. on Fracture Mechanics of Concrete and Concrete Structures (FraMCoS-7), Jeju, Korea, May 24, 2010.

B. Distinguished, Named or Endowed Lectures Lectures at Universities and Research Institutions


7. Failure of materials and structures: lessons from the past, highlights of success and view toward the future, Karlsruhe University, Karlsruhe, Germany, March 23, 1998 (honorary doctorate lecture).


11. Size effect and need for reform of reliability concepts for quasibrittle structures, Beyer Distinguished Lecture, Dept. of Civil and Envir. Engrg., University of Houston, April 8, 2005.


19. Scaling of probability distribution of quasibrittle


27. Pervasiveness of concrete creep problems in structures: Wake-up call for design codes and consequences of nano-porosity. Honorary Professor Lecture, Xi’an Jiaotong University, Xi’an, China.


C. Invited Conference Lectures


10. Nonlinear deformations and failure of concrete, Opening Lecture at Seminar on Analysis of Reinforced Concrete Structures by Finite Element Methods, held in commemoration of 50th anniversary of School of Rein. Concrete, Politecnico di Milano, Milano, Italy, June 20, 1978.


20. Constitutive relations for viscoplastic behavior of


42. Yield limit degradation: Nonlocal continuum model with local strain (co-authors F.-B. Lin and G. Pijaudier-Cabot), Invited Opening Lecture, Int. Conf. on Computational Plasticity (COMPLAS-1), Barcelona, Spain, Apr. 6, 1987.

43. Fracture energy of heterogeneous materials and similitude, Invited Lecture, Intern. Conf. on Fracture of Concrete and Rock, Wyndham Hotel, Greenspoint, Houston, June 18, 1987.

44. Distributed damage and application of nonlocal and microplane effects (co-authors G. Pijaudier-Cabot and P. C. Prat), 9th Int. Conf. on Struct. Mech. in Reactor Technology (SMiRT), Lausanne, Aug. 17, 1987.


50. Stable propagation of interacting crack systems and
modeling of damage, co-authored with M. R. Tabbara, invited lecture in Division of Concrete and Nonmetallic Materials, 16th International Conference on Structural Mechanics in Reactor Technology, Anaheim, California, August 14, 1989.


52. Bifurcations and thermodynamic criteria of stable paths of structures exhibiting plasticity and damage propagation, 2nd. Int. Conf. on “Computational Plasticity (COMPLAS-2),” Barcelona, Spain, September 18, 1989.


54. Geometric damage tensor uncoupled from constitutive properties of strain-softening materials (co-author: I. Carol), Symposium on Theoretical, Experimental, and Computational Problems Related to Concrete, Rock and Soils at 15th Northeastern Conference on Theoretical and Applied Mechanics, OMNI Hotel, Atlanta, March 25, 1990.


70. Public funding of university research and graduate programs, Centennial Annual Conference, American Society for Engineering Education, University of Illinois, Urbana, IL, June 21, 1993.

71. Preliminary guidelines and recommendation for characterizing creep and shrinkage in structural design (with RILEM Committee TC 107), ConCreep 5 (5th RILEM International Symposium on Creep and Shrinkage of Concrete), Barcelona, Sept. 7, 1993.

72. Solidification theory: A rational and effective framework for constitutive modeling of aging viscoelasticity (presented by co-author I. Carol), ConCreep 5 (5th RILEM International Symposium on Creep and Shrinkage of Concrete), Barcelona, Sept. 8, 1993.


77. Concrete creep and shrinkage prediction models for design codes: recent results and future directions (with S.


81. Size effect in quasibrittle fracture: Some recent advances. Invited Principal Lecture. 9th Int. Conf. on Fracture, Sydney, Australia, April 1, 1997.


83. Size effect in compression fracture, 2nd EURO-Conf. on Material Instabilities in Deformation and Fracture, held at AUT, Thessaloniki, Greece (chair E.C. Aifantis), Sept. 3, 1997.

84. Creep and shrinkage prediction model for analysis and design of concrete structures (Model B3) (presented by co-author S. Baweja), ACI Convention, Atlanta, GA, Nov. 10, 1997.


86. Rational prediction of creep and shrinkage of concretes, ACI Paris Chapter Workshop on Creep and Shrinkage in Concrete Structures, held at LCPC, Paris, April 6, 1998.


89. Scaling of compression fracture of fiber composites, Sandwiches and other quasibrittle materials. 6.1/6.2 Workshop, Office of Naval Research, Naval Surface Warfare Center, Carderock, Maryland, April 28, 1999.

90. Spatially and directionally discrete computational models for fracturing-plastic materials with size effects in tension and compression. Workshop on Computational Exploration of Discrete Media, US Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi, Nov. 9, 1999.


93. Struggle and thrill in a quest to prevent fracture and collapse of structures, 20th Anniversary World Congress (“Civil Society and democracy into the new millennium”), Czechoslovak Society of Arts and Sciences (Spoléčnost pro vědu a umění, SVU), American University, Washington, D.C., August 10, 2000.


100. Scaling in solid mechanics: from nano to mega. Opening keynote lecture. Int. Conf. on Composites in Material and Structural Engineering (80th Anniversary of Klokner Institute), Prague, June 4, 2001.


106. Scaling aspect of material durability problems.
97. Computational and analytical approaches to scaling in solid mechanics: From nano to mega. Sectional keynote lecture, 5th World Congress on Computational Mechanics, TU Wien, Vienna, July 9, 2002.

98. Shear buckling of fiber composites and sandwich structures: Paradox resolved (with A. Beghini), 14th Int. Conf. on Composite Materials (ICCM), San Diego (Manchester Hyatt Regency Hotel), July 14, 2003.


103. Energetic-statistical size effect in composites and sandwich structures (plenary symposium lecture). IC-CES04 (Int. Conf. on Computational & Experimental Engineering & Sciences), Symposium on Composites: Experiment and Analysis, Madeira (Savoy Resort), Portugal, July 27, 2004.


107. Energetic-probabilistic size effects in cohesive fracture and asymptotic matching, Conference on Friction, Fracture and Earthquake Physics, Kavli Institute of Theoretical Physics, University of California, Santa Barbara, August 16, 2005.


116. Microplane modeling of damage and fracturing in particulate and fiber composites and bio-materials. Opening lecture of Symp. on Advances in Computational Mechanics in Honor of Prof. Maier, 8th World Congress on Computational Mechanics (WCCM8), June 30, 2008, Venice-Lido, Italy.


119. Atomistic fracture and nano-macro transition for strength and lifetime of quasibrittle structures, Sectional Keynote Lecture, 12th Int. Conf. on Fracture (ICF12), Ottawa, Canada, July 15, 2009.

120. Quasibrittle size effect: Problems and Progress, Sectional Keynote Lecture, 12th Int. Conf. on Fracture (ICF12), Ottawa, Canada, July 16, 2009.


123. Multiscale nano-macro transition for strength and


125. Sealing of data from structural failures and damages: Hindrance to progress. 21st Meeting of the National Academies Committee on Science, Technology and Law, Washington, DC, April 11, 2011.


128. Panel discussion on ”Infrastructure—Past, Present and Future”, Dept. of Civil & Env. Engineering, Northwestern University, Apr. 29, 2011.


D. Seminars at Universities and Laboratories


17. Constitutive relations for concrete, Univ. of Texas, Austin, Jan. 1969.


20. On general incremental three-dimensional theories of elastic instability, University of California, Berkeley, May 19, 1969.


38. Inelastic behavior of concrete, Georgia Inst. of Technology, Atlanta, April 6, 1976.
44. On crack stability and related subjects, Royal Inst. of Technology (KTH), Faculty of Aerospace Engineering, (Dept. of Solid Mechanics), Stockholm, Sept. 13, 1977.
46. Lecture series on inelastic behavior of concrete, National University of Mexico, Nov. 8-10, 1977.
74. Practical models for concrete creep, State Research Center, Concrete Lab., Espoo, Finland, Aug. 27, 1979.
85. Practical creep analysis and design, Ontario Hydro, Aug. 20, 1980.
94. Endochronic theory for soils, School of Civil Engng, University of Madrid, June 5, 1981.
95. Inelastic behavior of geomaterials, University of Madrid, June 8, 1981.
96. Fracture of reinforced concrete (in German), Technichal University, Vienna, June 11, 1981.
100. La rupture et la propagation des zones de fissuration dans le béton et les roches (presented in French), École Polytechnique de Montreal, March 4, 1982.
101. Fracture and propagation of cracking zones in concrete and rock, Seminars in Mechanics, McGill University, Montreal, March 5, 1982.
103. Concrete fracture, Seminar at Universita degli Studi di Bologna, Italy, March 29, 1982.
111. Constitutive equation of wood at variable humidity and temperature, Forest Products Laboratory of U.S. Dept. of Agriculture, Madison, Wisc., Oct. 18, 1982.
114. Size effect in reinforced concrete failure, with application to shear of beams (presented in French), Swiss Federal Inst. of Technology, Lausanne, June 8, 1983.
127. Size effect caused by fracturing in concrete structures, Univ. of Cape Town, Dec. 6, 1984.
134. Concrete structures for nuclear reactors, Seoul National University, Korea, June 4, 1985.
135. Fracture mechanics of concrete structures and size effect, Univ. of Canterbury, Christchurch, New Zealand, Nov. 8, 1985.
141. Fracture mechanics of concrete structures and size effect, Univ. of Sydney, Australia, Dec. 6, 1985.
142. Probabilistic approach to the prediction of creep and shrinkage of concrete, Univ. of New South Wales, Kensington, N.S.W., Australia, Dec. 9, 1985.
146. Size effect in brittle failure of concrete structures, Colloquium on Modern Topics in Mechanics, Northwestern University, Jan. 31, 1986.
147. Size effect in failure due to distributed cracking, Faculty Seminar Series, Univ. of Minnesota, Apr. 25, 1986.
149. Improved serviceability design of prestressed concrete box girder bridges against long-time deflections and cracking, ASCE Illinois Section Dinner Meeting, Chicago, May 28, 1986.
151. Mécanique de fissuration distribuée et effet d'échelle (in French), Laboratoire de Mecanique et d'Acoustique C.N.R.S., Marseille, July 2, 1986.
152. Size-effects and fracture mechanics of concrete structures, Dipartimento di ingegneria strutturale e Geotecnica, Universita degli Studi di Roma, Italy, Sept. 29, 1986.
161. Effet d'échelle et localization dans les matériaux avec radoucissement (delivered in French), Laboratoire de Mécanique et Technologie, E.N.S. de Cachan, Université Paris 6, Oct. 9, 1986.
166. Size effects in concrete structures, University of Kyoto, Japan, Feb. 6, 1987.
174. Why continuum damage is nonlocal: justification by a quasiperiodic crack array, Mechanics Club Seminar, Northwestern University, Nov. 5, 1987.1
178. Stability and bifurcation in structures exhibiting damage, fracture or plasticity, Civil Engineering Guest Lecture, University of Alberta, Edmonton, Canada, Feb. 11, 1988.
181. Stable response paths of structures with damage, cracking or plasticity, Civil Engineering Seminar, Ohio State University, Columbus, May 27, 1988.
182. Stability of state and path of structures exhibiting damage, interacting cracks or plasticity, Guest Seminar, Laboratory of Mechanics and Technology, Ecole Normale Supérieure, Université Paris 6, Cachan, July 1, 1988 (presented in French).
186. Stable path of propagation of interacting fractures or damage zones, Structural Engineering Seminar at Cornell University, September 15, 1988.
188. Stability of state and path of structures exhibiting damage, interacting cracks or plasticity, Seminar in Solid Mechanics, Department of Mechanical Engineering, Aeronautics and Astronautics and Civil Eng., Stanford University, October 20, 1988.
189. Brittleness and size effect in structural failures of concrete and rock, Distinguished Civil Engineering Lecture Series (jointly with Mechanics and Materials Seminars), Texas A&M University, College Station, November 1, 1988.
190. Stable states and stable paths of structures with plasticity, damage or fracture propagation, seminar at Universidad de Buenos Aires, Argentina, January 9, 1989.
192. Applications of fracture mechanics to the design of concrete structures and size effect, seminar at Faculty of Physical Sciences and Mathematics, Universidad de Chile, Santiago, January 16, 1989.
196. Size effect and nonlocal aspects of fracture in concrete, rock and ceramics, seminar at Department of Civil Engineering, University of Arizona, Tucson, February 27, 1989.
197. Localization of damage in solids, seminar in Department of Civil Engineering, Mechanics, and Metallurgy, The University of Illinois at Chicago, March 8, 1989.
198. Localization of damage, bifurcation and nonlocal stress-strain relations, seminar in Department of Civil Engineering, University of California, Davis, May 1, 1989.
203. Should concrete design codes consider fracture mechanics size effect?, Technical University of Munich, Germany, February 5, 1990.
204. Fracture mechanics of concrete structures and size effects, University of Karlsruhe, Institute of Mechanics and Institute of Materials Technology, February 6, 1990.
205. Size effect in fracture mechanics and its application to concrete structures (presented in French), org. by...


208. Computational mechanics of fracture and damage in quasi-brittle structures, Stuttgart University, Germany, Sept. 4, 1990.


211. Statistical and deterministic size effects in fracture of quasi-brittle materials, Dept. of Mining Engineering, University of California, Berkeley, Nov. 6, 1990.


217. Recent advances in deterministic and statistical theories of size effect in structures with damage and localization (presented in French), Laboratory of Mechanics, E.N.S. de Cachan, France, Feb. 7, 1991.


222. Should fracture mechanics size effects be introduced into concrete design codes? Dept. of Civil and Mineral Engineering, University of Minnesota, Minneapolis, MN, March 1, 1991.


229. Instabilities and bifurcations in structures with strain-softening damage (presented in Czech), Klokner Institute, Czech Technical University, Prague, Czechoslovakia, July 3, 1991.

230. Instabilities and bifurcations caused by localization of damage or fracture, Institute of Mechanics, Dept. of Mechanical Engineering, Technische Universität, Darmstadt, July 8, 1991.


233. Consequences of fracture mechanics for future design practice and codes for reinforced concrete structures, a lecture for practicing engineers sponsored by the Chinese Institute of Civil and Hydraulic Engineering and the Chinese Society of Structural Engineering, Dept. of Civil Engineering, National Taiwan University, Taipei, Aug. 26, 1991.

234. Nonlocal generalization of Weibull statistical strength theory, Center for Earthquake Engineering Research, National Taiwan University, Taipei, Aug. 27, 1991.

235. Should design codes consider fracture mechanics size effect? Korea Institute of Construction Technology (co-sponsored by Korean Concrete Institute, KCI), Seoul, Korea, Aug. 29, 1991.


237. Critique and nonlocal generalization of Weibull-type random strength theories for quasi-brittle structures, Colloquium on Modern Topics in Mechanics, Northwestern University, October 18, 1991.


244. Recent results on scaling laws for fracture and damage and nonlocal continuum models (presented in Czech), Institute of Theoretical and Applied Mechanics (UTAM), Prague, Czech Republic, September 3, 1992.

245. New nonlocal damage concept for concrete based on micromechanics of crack interactions, IWCB, Stuttgart University, Germany, September 11, 1992.


247. New nonlocal damage concept based on micromechanics of crack interactions, University of Southern California, Los Angeles, November 10, 1992.


250. Scaling laws and nonlocal concepts for mechanics of damage, Clarkson University, Potsdam, NY, January 15, 1993.


258. Stability, localization and scaling problems in the theory of damage and fracture (presented in French), Dept. of Civil Engineering, INSA, Lyon, France, February 17, 1993.


261. Scaling laws and nonlocal concepts for mechanics of damage, Thayer School of Engineering, Dartmouth College, Hanover, NH, March 19, 1993.


263. Scaling laws and nonlocal concepts in mechanics of damage and fracture (presented in French), Ecole Polytechnique, Montreal, Quebec, Canada, April 29, 1993.

264. Scaling laws and nonlocal concepts in mechanics of quasibrittle materials (presented in French), University of Sherbrooke, Quebec, Canada, May 5, 1993.

265. Scaling laws and nonlocal concepts for mechanics of damage, Nagoya University and Japan Society of Civil Engineers, Nagoya, Japan, November 4, 1993.


268. Nonlocal continuum damage theory based on micromechanics of crack interaction, Shell Development Company, Houston, TX, February 15, 1994 Lecturer on (Southwest Mechanics Lecture Series).

269. Nonlocal continuum damage theory based on micromechanics of crack interaction, Rice University, Houston, TX, February 16, 1994 (Southwest Mechanics Lecture Series).

270. Nonlocal continuum damage theory based on micromechanics of crack interaction, Texas A&M University, College Station, Houston, TX, February 17, 1994 (Southwest Mechanics Lecture Series).


284. Is fractal nature of crack surfaces the cause of size effect?, Building Materials Division, NIST (National Institute of Standards and Technology) Gaithersburg, Maryland, January 11, 1994.


286. Fracture propagation and scaling: fact or fad? Civil Engineering Faculty, Czech Technical University in Prague (ČVUT), February 6, 1995.


288. Microprestress solidification theory for concrete creep and humidity effects, Tohoku University, Sendai (hosts: Mihashi, Abe), Feb. 8, 1996

289. Recent research on fracture and size effect in quasibrittle materials, Hokkaido University, Sapporo (hosts: Kakuta, Joh, Goto), Feb. 10, 1996.

300. Recent results on size effect in concrete structures, Kajima Institute of Technology (hosts: Nojiri, Nobuta), Tokyo, Feb. 21, 1996.

301. Size effect in quasibrittle failure, Dept. of Civil Eng., University of Tokyo (hosts: Okamura, Maekawa), Feb. 23, 1996.


303. Recent researches in size effects in failure of concrete structures, Obayashi Research Institute, Tokyo, March 1, 1996.

304. Localization of damage. Politecnico di Milano, September 17, 1996.


331. Major structural failures: Their causes and how to avoid them, ASCE Student Chapter, Northwestern University, March 2, 1999.

332. Localization instabilities, ETSECCPB, Universitat Politècnica de Catalunya (UPC), March 17, 1999.


341. ibid., Institute of Construction and Architecture (ÚSTARCH), Slovak Academy of Sciences, Bratislava, Oct. 21, 1999.


380. Quasibrittle size effect, strength randomness and design codes. Warren Lecture (endowed) and Geomechanics Seminar, University of Minnesota, Dept. of Civil Engineering, Minneapolis, May 7, 2004.
381. Size effect in quasibrittle structures, strength randomness and design codes. Seminar, China University of Mining and Technology, Dept. of Civil Engrg., Beijing, June 24, 2004.
392. Size and Ruin, Meeting of Polish-American Engineers Association, Holiday Inn O’Hare, April 15, 2005.
399. Ditto, Seminar, Dept. of Civil Engrg., City College of New York (CCNY), City University of New York (CUNY), Nov. 4, 2005.
404. Statistical thermo-mechanics of reliability of brittle and quasibrittle structures: from nano to macro, Mechanical Engineering Graduate Seminar, University of Iowa, Iowa City, April 13, 2006.
405. Statistical mechanics of safety factors: from atomistic to structural scale. School of Civil Engineering, Georgia Institute of Technology, Atlanta, April 26, 2006.
408. What can we learn from the collapse of World Trade Center? (Co se můžeme naučit z ko-


416. Microplane modeling of damage or fracture, and multiscale concepts. Dipartimento di Ingegneria Strutturale, Politecnico di Milano, Nov. 13, 2007, Milan, Italy.


421. Failure risk and lifetime of quasibrittle structures: from atomistic to structural scale. ETH, March 7, 2008, Zürich-Hönggerberg, Switzerland.

422. Failure risk and lifetime of quasibrittle structures: from atomistic to structural scale. ESPCI (Ecole supérieure de physique and de chimie industrielle), LPCT (Laboratoire de physique et chimie théorique), March 21, 2008, Paris 5.


433. Scaling of quasibrittle structure strength and lifetime based on atomistic fracture mechanics, and analogy with high-k dielectrics, Seminar of Dept. of Materials and Engrg., Northwestern University, Evanston, IL, June 2, 2009.

434. Scaling of quasibrittle structure strength and lifetime based on atomistic fracture mechanics, and analogy with high-k dielectrics, GALCIT Colloquium, Graduate Aerospace Laboratories, California Institute of Technology, Pasadena, CA, June 5, 2009.


437. Scaling of quasibrittle strength and lifetime probability based on atomistic fracture mechanics, and analogy with high-k dielectrics, Dept. of Civil Engineering, University of Minnesota, Minneapolis, MN, Oct. 16, 2009.


439. Scaling of probability distribution of quasibrittle structure strength and lifetime based on atomistic fracture mechanics. Faculty of Civil Engineering, Czech Technical University, Prague, March 11, 2010.


442. Progress engendered by collapses of record setting structures: Malpasset Dam, World Trade Center tower and KB Bridge in Palau. Dept. of Civil Engineering, University of British Columbia, Vancouver, BC, Canada, Nov. 15, 2010.


446. Progress engendered by collapses of record setting structures: World Trade Center Towers, Malpasset Dam and KB Bridge in Palau. Dept. of Mechanical Engrg., Tel Aviv University, Tel Aviv, Israel, Sept. 14, 2011.


448. Disjoining pressure and sorption hysteresis of adsorbate in nanoporous materials, Faculty-Faculty Seminar, Northwestern University, Jan. 3, 2012.


454. Errors of ABAQUS, LS-DYNA, ANSYS and other commercial codes caused by using energy-inconsistent objective stress rates (co-authors J. Vorel and M. Gattu), NU 2012 Summer Workshop on Computational Science and Engineering (in honor of Wing-Kam Liu’s 60th birthday), Hilton Garden Inn, Evanston, IL, July 23, 2012.


E. Contributed Conference Papers


2.-8. At least seven papers at conferences in Czechoslovakia, between 1960 and 1966, presented in Czech, Russian, German and English (CS-VTS Prague, SU-CVUT Conf. Prague, Brno, Bratislava, Žilina, Smolenice, etc.).


43. Hydraulic fracture and heat extraction from hot dry rock masses (with S. Nemat-Nasser), 2nd Int. Conf. on Num. Methods in Geomechanics, VPI, Blacksburg, VA, June 1976.


46. General numerical method for three-dimensional singularities in cracked elastic solids (co-authored with L. F. Estenssoro), 4th Int. Conf. on Fracture, Univ. of Waterloo, Canada, June 21, 1977.


48. Discussion on practical prediction of creep, RILEM Symposium on Creep (attendance by invitation only),


73. Tension stiffening effect in rough crack model for reinforced concrete (co-author P. Gambarova), SMiRT6, Aug. 17, 1981.

74. Design of top closures of concrete reactor vessels with very high energy absorption capability (co-authors A. H. Marchertas, R. W. Seidensticker) SMiRT6, Aug. 18, 1981.


78. Cyclic creep of concrete under various moisture conditions, Z. P. Bažant and L. Panula, Session No. 54-S4.2 at ASCE Nat. Spring Convention, Caesar's Palace, Las Vegas, Nevada, Apr. 29, 1982.


95. Model of weak planes for concrete subject to tension and shear (with P. Gambarova, presenter), RILEM Int. Conf. on Concrete Materials under Multiaxial Conditions, Toulouse, France, May 24, 1984.


104. Fracture theory for nonhomogeneous brittle materials with application to sea ice, Arctic 85 - ASCE Nat. Conf. on Civil Engng. in the Arctic Offshore, San Francisco (Sheraton Palace), Mar. 27, 1985.


111. Size effects in failure due to distributed cracking (with F.-B. Lin and S. Seuer), 10th U.S. Congress of Applied Mechanics, Univ. of Texas, Austin, June 19, 1986.


118. Fracture energy of concrete (presented by co-author P. Pfeiffer), J. and B. Mather Intern. Conf. on Concrete Durability, Atlanta, Apr. 28, 1987.


121. Fracture tests of concrete using different specimen
geometries (co-authors P. A. Pfeiffer and G. Pijaudier-Cabot), 9th Int. Conf. on Struct. Mech. in Reactor Technology (SMIRT), Lausanne, Aug. 17, 1987.


124. Fracture mechanics size effects and ultimate load formulas for brittle failures of concrete structures, ACI Fall Convention, Seattle, Nov. 12, 1987.


135. Local and nonlocal models for strain-softening and their comparison based on dynamic analysis, France-U.S. Workshop on Strain Localization and Size Effect Due to Cracking and Damage, sponsored by NSF and CNRS, held at Ecole Normale Supérieure, Paris Cachan, France, presented by co-author G. Pijaudier-Cabot, September 8, 1988.


140. Recent advances in stability of structures with plasticity, damage or fracture, co-authored with L. Cedolin, R. Gettu, M. Kazemi and F.B. Lin, First Pan-American Congress of Applied Mechanics (PACAM), Catholic University (PUC), Rio de Janeiro, Brazil, January 5, 1989.


144. Long-term modeling and prediction, presentation on ACBM Thrust Program Group at ACBM Industrial Affiliates Meeting, Northwestern University, June 7, 1989.


146. Micro and macro-modeling of material damage due to cracking, ibid., July 12, 1989.

147. Fracture Mechanics of Concrete: Recent Developments (Introductory Lecture of a Short Course), Swiss Federal Institute of Technology, Lausanne, Sept. 25, 1989.

148. Probabilistic prediction of creep and shrinkage in concrete structures: Combined sampling and spectral approach, co-authored with Y. Xi, Fifth International Conference on Structural Safety and Reliability (ICOSSAR), Parc Fifty-Five Hotel, San Francisco, August 9, 1989.

149. Rate processes in the fracture of cement composites (co-author: K. T. Faber), Semi Annual Meeting, NSF Center for Advanced Cement-Based Materials, Northwestern University, Evanston, October 18, 1989.


151. Cracking damage and creep in a drying box girder bridge segment (co-author: V. Křížek), ACI Fall Convention, San Diego, CA, November 2, 1989.


154. Interacting crack systems in particulate or fiber reinforced composites, presented by co-author G. Pijaudier-Cabot (also co-authored by Y. Berthaud), 5th Int. Conf. on Numerical Methods in Fracture Mechanics, Freiburg, Germany, April 23-17, 1990.


158.Brittleness of high strength concrete, presented by co-author R. Gettu (also co-authored by M. E. Karr), ibid., August 14, 1990.


165. Modeling of cracking induced damage in particulate and fiber composites (co-authored with G. Pijaudier-Cabot and Y. Berthaud), 111th ASME Winter Annual Meeting, Dallas, TX, Nov. 27, 1990.

166. Equilibrium path bifurcation due to strain softening localization in ellipsoidal region, 111th ASME Winter Annual Meeting, Dallas, TX, Nov. 27, 1990.


171. Transport properties, Joint External and Internal Advisory Board Meeting, NSF Center for Science and Technology of Advanced Cement-Based Materials, Northwestern University, May 9, 1991.


177. Fracture energy and effective process zone, presentation at Northeast Regional Review Agenda, Office of Naval Research, Arlington, VA., October 22, 1991 (with D. Sodhi).


183. Markov model for random growth of crack with R-curve (co-author Y. Xi), First Int. Conference on Fracture Mechanics of Concrete Structures (FraMCoS 1), Breckenridge, Colorado, June 1, 1992.


192. Instabilities and bifurcations due to strain-softening damage and fracture (co-authors L. Cedolin and J. Ožbolt), 18th Int. Congress of Theoretical and Applied Mechanics, Haifa, Israel, August 25, 1992.


195. Size effect due to fracture behavior and its impact on design code, ACI Fall Convention, San Juan, Puerto Rico, October 29, 1992.


197. Fracture of random quasibrittle materials: Markov process and Weibull-type models (with Y. Xi), 6th International Conference on Structural Safety and Reliability (ICCOSSAR), Innsbruck, Austria, August 11, 1993.

198. Effects of crack growth rate and creep in static fracture of concrete (with M. Jirásek), Invited Lecture, Division H, 12th International Conference on Structural Mechanics in Reactor Technology (SMiRT), Stuttgart University, Germany, August 17, 1993.


200. New test method to separate microcracking from drying creep (co-author Y. Xi), ConCreep 5 (5th RILEM International Symposium on Creep and Shrinkage of Concrete), Barcelona, Sept. 7, 1993.

201. ConCreep 5 (5th RILEM International Symposium on Creep and Shrinkage of Concrete), Barcelona, Sept. 8, 1993.


209. Fracture behavior and process zone, Presentations to Site Visit Team to decide funding renewal for NSF S&T ACBM Center, Northwestern University, September 8, 1994.


211. New continuum damage model with non locality derived from microcrack interactions, AFSOR Contractors’ Meeting on Mechanics of Materials and Structural Mechanics, University of Illinois, Chicago, September 27, 1994 (presented by G.J. Dvorak).


215. Microplane model for concrete, Meeting of "Penetration Technology Coordination Group", U.S. Army Corps of Engineers Waterways Experiment Station (WES) Vicksburg, Mississippi, December 6, 1994.

216. Modeling of fracture and damage in concrete, ACI Spring Convention, Salt Lake City, March 6, 1995.


220. Nonlocal microplane model for damage due to


225. Seismic localization of softening cracking damage in concrete frames (with Jirásek), Second International Conference on Fracture Mechanics of Concrete and Concrete Structures, ETH (Swiss Federal Institute of Technology), Zürich, July 25, 1995.

226. Particle model for fracture and statistical micro-macro correlation of material constants (with Jirásek, presenter), Second International Conference on Fracture Mechanics of Concrete and Concrete Structures, ETH (Swiss Federal Institute of Technology), Zürich, July 26, 1995.


228. Basic problems in size effects. Workshop on Size Effects, as part of 2nd Int. Conf. on Fracture Mechanics of Concrete and Concrete Structures (FraMCos-2), ETH (Swiss Federal Institute of Technology), Zürich, July 26, 1995.


230. Finite strain analysis of deformation of quasibrittle material during missile impact and penetration (co-authors M. Adley and Y. Xiang), Int. Mechanical Engineering Congress, ASME, Atlanta (Hilton), November 21, 1996.


234. Tangential stiffness of elastic material with growing or closing cracks (with P.C. Prat), Joint ASCE-ASME-SES Mechanics Conference (McNU), Northwestern University, June 30, 1997.


238. Recent researches in failure mechanics at Northwestern University, Post-Conf. Seminar of 2nd EURO Conf. on Material Instabilities in Deformation and Fracture, held at Porto Carras, Chalkidiki, Greece, Sept. 6, 1997.


241. Statistical and fractal aspects of size effect in quasibrittle structures: conspectus of recent results (co-author Drahomír Novák), 7th International Conf. on Structural Safety and Reliability (ICOSAR ’97), Kyoto, Japan, Nov. 26, 1997.

242. Fracture and size effect in composite beams with deformable connectors (co-author J.L. Vitek), Conf. on Computational Modeling of Concrete Structures (EURO-C), held in Badgastein, Austria, April 1, 1998.


256. Simulation of size effect in compression kink band failure of fiber composites by cohesive crack model and nonlocal LEFM (co-authors G.S. Zi, M. Brocca and E. Becq-Giraudon), *ibid.*, Aug. 4, 1999.


293. Computational modeling of statistical size effect in quasi-brittle structures (co-authors D. Novák, M. Vorechovsky), 9th Int. Conf. on Applications of Statistics and Probability in Civil Engineering (ICASP-9), San Francisco (Sir Francis Drake Hotel), July 8, 2003.

294. Consequences of fracture mechanics for size effect in shear failure of beams (with Q. Yu and M.T. Kazemi), ACI Convention, Boston (Sheraton), Sept. 30, 2003.


306. Stability of structures soft in shear: Orthotropic, layered and sandwich structures (presented by co-author A. Beghini), ASME Annual Convention, Anaheim (Con-

308. Procedure of statistical size effect prediction for crack initiation problems (presented by co-author M. Vörechovský), 11th Int. Conf. on Fracture (ICF-11), Turin, Italy, March 23, 2005.


310. Creep and fracture in concrete structures at high temperature (delivered in Czech), Institute of Structural Mechanics, Faculty of Civil Engineering, Czech Technical University, Prague, May 24, 2005.

311. Necessity of Reform of Reliability Concepts for Quasibrittle Structures (delivered in Czech), Institute of Structural Mechanics, Faculty of Civil Engineering, Brno University of Technology, Brno, Czech Republic, May 25, 2005.


313. Revision of reliability concepts for quasibrittle structures and size effect on probability distribution of structural strength (co-author S. Pang), 9th Int. Conf. on Structural Safety and Reliability (ICOSSAR 2005), Università “La Sapienza”, Rome, Italy, June 20, 2005.

314. Role of deterministic and statistical length scales in size effect for quasibrittle failure at crack initiation (co-authors M. Vörechovský and M. Novák), 9th Int. Conf. on Structural Safety and Reliability (ICOSSAR 2005), Università “La Sapienza”, Rome, Italy, June 20, 2005.

315. Why is the initial trend of deflections of box girder bridges deceptive? (presenter V. Kristek, co-authors Bažant, M. Žich, A. Kohoutková), 7th Int. Conf. on Creep, Shrinkage and Durability of Concrete and Concrete Structures (Concreep 7), École Centrale de Nantes, France, Sept. 12, 2005.

316. How to Improve design against size effect in beam shear in ACI-318, Meeting of ACI Committee 445, Shear and Torsion, ACI Fall Convention, Kansas City, Nov. 7, 2005.

317. Lattice-cell approach to quasibrittle fracture modelling (presenter: P. Grasso, co-authors Bažant and G. Cusatis), Conf. on Computational Modelling of Concrete Structures (EURO-C 2006), Mayrhofen, Austria, March 27, 2006.


332. Mesomechanical multiscale elastic-fracturing model for braided composites (co-authors: F. Caner, C.


335. Unbiased statistical comparison of creep and shrinkage prediction models. Meeting of ACI Committee 209, Creep and Shrinkage, ACI Spring Convention, March 31, 2008, Los Angeles.


338. Consequences of fracture mechanics for size effect, crack spacing, and crack width in concrete pavements. 6th RILEM Int. Conf. on Cracking in Pavements, Holiday Inn, Chicago, June 16, 2008.


347. Analysis of causes of excessive long-time deflections of the prestressed box girder bridge in Palau, presentation to ACI-209 Committee meeting, ACI Spring Convention, San Antonio, TX, March 16, 2009.

348. Explanation of excessive long-time deflection of collapsed record-span box girder bridge in Palau, SEA0I Midwest Bridge Symposium, Chicago, April 23, 2009.


354. How to enforce non-negative energy dissipation in microplane and other constitutive models for softening damage, plasticity and friction (co-authors J.-Y. Wu, F.C. Caner & G. Cusatis), EURO-C (Computational Modeling of Concrete Structures), Rohrmoos/Schladming, Austria, March 18, 2010.

355. Misconceptions on variability of fracture energy, its uniaxial definition by work of fracture, and its presumed dependence on crack length and specimen size. 7th Int. Conf. on Fracture Mechanics of Concrete and Concrete Structures (FraMCoS-7), Jeju, Korea, May 24, 2010.


363. Evolution of deflections of prestressed bridges of large spans as a basis for calibrating prediction models for concrete creep (co-authors V. Krštek and V. Vrablík), presented by Krštek at Betonářské dny 2010 (Concrete Days), held in Hradec Králové, Czech Rep., Nov. 2010.


365. Excessive bridge deflections and their inverse analysis: Overview of Some Latest Results and Work in Progress, Presentation and Infrastructure Technology Institute Meeting, Northwestern University, Feb. 7, 2011.

366. Consequences of long-term bridge deflections data for the creep prediction model, Meeting of ACI-Committee 209, Creep and Shrinkage of Concrete, Am. Concr. Inst. Spring Convention, Tampa, FL, April 4, 2011.


368. Large sandwich panels for lightweight ship hulls: Buckling with fracture and size effect. ONR (Office of Naval Research) Program Review Meeting, Arlington, VA, July 12, 2011.


377. Corrections to ABAQUS, ANSYS, LS-DYNA and other FE Codes required by work-conjugacy and orthotropy effects in finite strain and stability analyses (co-authors M. Gattu and J. Vorel), *ibid.* June 18, 2012.


387. Scaling of failure probability of quasibrittle structures with large cracks, ditto, June 18, 2013.

388. Development and validation of model B4 for concrete creep and shrinkage (presented by co-author R.

389. Microplane finite element analysis of alkali-silica reaction (presented by co-author An Duan); ditto, August 6, 2013.

390. Statistical distribution of residual strength after a period of constant load and size effect (presented by co-author M. Salviato); ditto, August 6, 2013.

391. Fracture and size effect on strength of plain concrete disks under biaxial flexure analyzed by microplane model M7 (presented by co-author K. Kirane); ditto, August 6, 2013.

392. A microplane damage model for rocks (presented by co-author Xin Chen); ditto, August 6, 2013.

393. Theory of cyclic creep of concrete based on fatigue of subcritical microcracks (presented by co-author M.H. Hubler); ditto, August 6, 2013.

Conferences in Honor of Bažant

5. Asian Special Workshop on Concrete Technology in Honor of the 70th Birthday of Prof. Zdeněk P. Bažant, chaired by Ta-Peng Chang and Jenn-Chuann Chern at TCI Annual Meeting, Taiwan National University, Nov. 2, 2008, Taipei, Taiwan.

Intensive Short Courses Taught Abroad

7. Lausanne, Switzerland, Sept. 1987 (5 day, 24-hour course).
9. Fracture and Damage in Concrete Structures, Technische Universität Stuttgart, Sept. 3-5, 1990 (2-day, 12 hour course).
11. Lausanne, Switzerland, March 1996 (4 day, 24 hour course).
12. Lulea University, Sweden, Sept. 1995 (4 day, 24 hour course).
15. Localization instabilities, fracture and size effects in quasi-brittle materials, ETSECCPB, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain, March 17, 18, 22, 23, 24, 25, 1999 (18 hour course).
16. Fracture, damage localization and size effects in quasibrittle structures. Politecnico di Milano, Italy, April 3–7, 2000 (21 hour course)