

Resume of Sumit Basu

1. Contact Information

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2. Date of Birth : 26.09.1968

3. Educational Qualifications:

S.No.	Degree	Institute	Year	Subjects
1	Bachelor of Engineering	Jadavpur University	1991	Mechanical Engineering
2	Master of Engineering	Indian Institute of Science	1994	Mechanical Engineering
3	Ph.D	Indian Institute of Science	1999	Mechanical Engineering, Fracture Mechanics

Details of professional training and research experience:

- 1) 1994-1999: Research Scholar at the Indian Institute of Science, Bangalore. **Topic of research:** *Numerical simulation of fracture initiation in ductile solids under Mode I dynamic loading.*
- 2) 1999-2001: Post doctoral fellow at the Micromechanics Group, Delft University of Technology, the Netherlands under funding from the Dutch Polymer Institute. **Topic of research:** *Analysis of the competition between crazing and shear yielding in glassy amorphous polymers.*
- 3) 2001-2002: Post doctoral fellow at the Department of Applied Physics, University of Groningen, Netherlands. **Topic of research:** *Analysis of metal polymer interfaces.*

Details of employment

1. Post doctoral fellow at the Delft University of Technology, the Netherlands from May 1999-May 2001.
2. Post doctoral fellow at the University of Groningen, the Netherlands from May 2001-August 2002.
3. Assistant Professor at the Mechanical Engineering Department, Indian Institute of Technology Kanpur from September 2002 onwards.

Research Interests:

- 1) Mechanics of deformation and fracture in amorphous glassy polymers. (Thermo-mechanics and cohesive zone modelling of crazing)
- 2) Multiscale modelling of polymers (Molecular dynamics and mesoscale simulations of macromolecular systems)
- 3) Electro-elastic interactions with reference to dielectric failure and behaviour of smart particulate composites (Failure of ultra high voltage insulation systems and damping characteristics of magnetostrictive particulate composites).
- 4) Dynamic fracture mechanics (Damage accumulation in nuclear piping under mechanical and thermal shock loading).

Research Projects:

- 1) Fundamental investigations into the behaviour of polymeric adhesives and adhesive joints. Funded by the Indian Space Research Organisation. Duration: June 2003-June 2006.
- 2) Numerical investigation on the failure of metal-polymer interface. Fast track scheme, Department of Science and Technology, Govt. of India. Duration Aug 2003-Aug 2006.
- 3) Multiscale modeling of deformation and fracture in glassy, amorphous polymers. Department of Science and Technology, Govt. of India, Duration: Oct 2004-Oct. 2007.

Courses Taught

- 1) Fracture and Fatigue
- 2) Advanced Mechanics of Solids
- 3) Modelling of Mechanical Properties of Materials
- 4) Science and technology at nanoscales

List of publications

Peer reviewed journals

1. Estevez, R., Basu, S. and Van der Giessen, E. 2004. Analysis of temperature effects near mode I cracks in glassy polymers, accepted for publication in International Journal of Fracture.
2. Basu, S., Mahajan, D.K. and Van der Giessen, E. 2005. Micromechanics of the growth and failure of a craze fibril in glassy polymers. Accepted by POLYMER.
3. Basu, S. and Van der Giessen, E., 2002. A thermo-mechanical study of mode I, small-scale yielding crack-tip fields in glassy polymers. Int. J. Plasticity, 18, 1395-1423.

4. Basu, S. and Narasimhan, R. 2000. A numerical investigation of loss of crack tip constraint in a dynamically loaded ductile specimen, *J. Mech. Phys Solids*, v48, 1967-1985.
5. Basu, S. and Narasimhan, R. 2000. A comparative study of dynamic, ductile fracture initiation in two specimen configurations, *Int. J. Fracture.*, 102, 393-410.
6. Basu, S and Narasimhan, R. 1999. A finite element study of the effects of material characteristics and crack tip constraint on dynamic ductile fracture initiation, *J. Mech. Phys Solids*, v47, 325-350.
7. Narasimhan, R. and Basu, S. 1999. Numerical simulations of fracture initiation in ductile solids, under Mode I, dynamic loading, *Bulletin of Materials Science*, v22, n5, 231-245.
8. Basu, S. and Narasimhan, R. 1996. Finite element simulation of mode I, dynamic ductile fracture initiation, *Int J. Solids Struct.*, v33, 1191-1207.

Book Chapters

1. Estevez R., Basu S., Van der Giessen E., 2003, Micromechanical modelling of rate and temperature dependent fracture of glassy polymers, in *Fracture of Polymers, Composites and Adhesives II*, ESIS book series 32, B.R.K. Blackman, A. Pavan, J.G. Williams (Eds), pp. 155-165.

Conferences

1. Kulmi U. and Basu S. 2004. Multiscale modelling of the deformation and fracture of amorphous glassy polymers, *Proceedings of the International Congress on Computational Mechanics and Simulation*, Kanpur.
2. Estevez R., Basu S., Van der Giessen E., A thermo-mechanical investigation of the influence of shear yielding and crazing on fracture characteristics of glassy polymers, *EUROMAT2000, SF2M-FEMS*, Tours, November ,2000
3. Basu S., Estevez R., Van der Giessen E., A thermo-mechanical analysis of shear yielding and crazing near crack tips in glassy polymers. In : *Deformation, Yield and Fracture of Polymers*, *Proceedings of the 11th International Conference*, Cambridge, April 10-13, 2000, The Institute of Materials, London, pp. 133-136.
4. Estevez R., Basu S., Van der Giessen E., 2003, On the competition between shear yielding and crazing near mode I cracks in glassy polymers, *Plasticity 2003*, Québec (Canada).

5. Estevez R., Basu S., Van der Giessen E., 2003, Computational analysis of rate and temperature dependent failure in glassy polymers, Int. Conf. Mech. Behaviour , ICM9, Geneve, Switzerland.
6. Estevez R., Basu S., Van der Giessen E., 2002, Thermo-mechanical analysis of glassy polymer fracture: time scales for deformation-mechanism and fracture maps, Matériaux 2002, Tours.
7. Basu S., Estevez R., Van der Giessen E., A thermo-mechanical analysis of shear yielding and crazing near crack tips in glassy polymers. In : Deformation, Yield and Fracture of Polymers, Proceedings of the 11th International Conference, Cambridge, April 10-13, 2000, The Institute of Materials, London.
8. Estevez, R., Basu, S. and Van der Giessen, E. 2000. A thermo-mechanical investigation of the influence of shear yielding and crazing on fracture characteristics of glassy polymers. Proceedings of the 4th EUROMECH Solid Mechanics Conference, Metz, France.
9. Basu, S. and Narasimhan, R. 1998. The influence of certain material characteristics and crack size effects on the initiation of a dynamic crack in a ductile material, Proceedings of the National Symposium on Aerospace Structures and Systems, Indian Institute of Technology Madras, Chennai, India.