

AVINASH PARASHAR (P.Eng.)

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Immigration & Professional Status

- **Permanent resident of Canada.**
- **Professional Engineer with Association of Professional Engineers and Geoscientists of Alberta**

Education

- **Ph.D.**, Mechanical Engineering, University of Alberta 2009- 2012
 - (GPA-4.0)
 - Computational mechanics, composites, nanocomposites
- **Masters**, Mechanical Engineering, Concordia University 2006-2008
 - (GPA-3.93)
 - Laser based nano-patterning of lens inserts
- **B.E.**, Mechanical Engineering, N.I.T. India 1998 - 2002
 - (79.5 %- Distinction with honors)

Professional Experience

- **Assistant Professor**, 2014-Present
Department of Mechanical & Industrial Engineering,
Indian Institute of Technology-Roorkee (India)
 - Teaching undergraduate & graduate level courses.
 - Developed courses for graduate and undergraduate level.
 - Supervising graduate students.
 - Associated with nanotechnology center.
- **Attached Scientist** 2013-2014
Atomic Energy of Canada Limited,
Chalk River Laboratories, ON (Canada)
 - Submitted a review report on hydride cracking in pressure tubes.
 - Simulated displacement cascade in single crystal of niobium.
 - Developed an atomistic model to study the effect of radiation damage on the mechanical and fracture properties of single crystal of niobium.

Teaching Experience

- **Courses Developed**
 - Nanomechanics to multiscale modeling (MI-600)/ Graduate level
 - Engineering Analysis and Design (MI-291)/ undergraduate level
- **Courses Taught**
 - Engineering Analysis and Design / *MI-291* (Assist. Prof. IIT Roorkee).
 - Machine Design/ *MI-212* (Assist. Prof. IIT Roorkee).
 - Engineering Drawing/ *MIN-108* (Assist. Prof. IIT Roorkee).
 - Measurement and Instruments / *MI-362* (Assist. Prof. IIT Roorkee).
 - Modeling and Simulation / *NT-504* (Assist. Prof. IIT Roorkee).
 - Mechanical Engineering Lab/ *Mec-403* (T.A. at University of Alberta).
 - Manufacturing Processes / *MIE 313* (T.A. at Concordia University).

Industrial & Administrative Experience

- **National Thermal Power Corporation** Sept 2004- Sept 2006
NTPC Ltd. India
 - Joined as executive engineer.
 - Worked in commissioning of thermal power plants.
- **Honda Siel Cars India Ltd** Oct 2003-Jul 2004
 - Joined as engineer in metal finish line.
 - Shift engineer, vehicle quality.
 - Coordinating departments to lower the defects/car.
- **LML Vespa Ltd.** Jul 2002-Oct 2003
 - Joined as graduate engineer in manufacturing management.
 - Coordinated project to reduce engine vibration.
 - Coordinated project on low-pressure casting.

Awards & Honors

- Atomic Energy of Canada Limited postdoctoral fellowship \$57200.
(2013-2014)
- NSERC (Visiting postdoctoral fellowship) \$47234.
(2013-14/declined)
- NSERC postgraduate scholarship \$63000.
(2009-12)

➤	Alberta innovates graduate scholarship in nanotechnology (2010-13)	\$64000.
➤	Ontario graduate scholarship (2009-12/declined)	\$45000.
➤	Presidents doctoral prize of distinction (2009-12)	\$20200.
➤	ASME OMAE Calgary graduate scholarship (2011-12)	\$3900.
➤	Tuition fees waiver (2009-10)	\$1500.
➤	University of Toronto fellowship (2009-10)	\$9000.
➤	President scout	

Funded Research Project

- **Title:** Tailoring of polymer properties using nanofillers
Funding agency: Indian Institute of Technology, Roorkee (Awarded)
- **Title :** A molecular dynamics based atomistic simulation to study the effect of nanofiller on the mechanical and thermal properties of polymer based nanocomposites.
Funding agency: Nanomission, Department of Science and Technology (Awarded)
- **Title:** Atomistic simulations to study the mechanical and fracture properties of nuclear materials.
Funding agency: BRNS, Department of Atomic Energy (Awarded)

Supervision of PhD Thesis

- **Title :** Atomistic simulations of graphene based nanocomposites
Candidate : Rajasekaran G.
- **Title:** Atomistic simulations to study the effect of boron nitride reinforcement on nanocomposites.
Candidate: Rajesh Kumar

Supervision of M.Tech Thesis

- **Title :** Atomistic simulations of vacancy defects in single and bilayer graphene
Candidate : Muse Degefe.

- **Title:** Molecular dynamics based investigation of radiation damage on the mechanical properties of Nb.
Candidate : Anil Kumar
- **Title:** Numerical simulations to estimate displacement threshold energy of Beryllium. (Project is under joint collaboration with German University)
Candidate : Rohit Kumar
- **Title:** Molecular dynamics based simulation to investigate sandwich structure.
Candidate : Mukesh Kumar
- **Title:** FEM based multi-scale model to study dynamic stability of CNT based nanocomposites.
Candidate : Anuj Pratap Singh

Supervision of B.Tech. Dissertations

- **Title:** Molecular dynamics based simulations to characterize defective nanofillers.
Candidate: Tamogna Biswas

Publications

Journal (Published/accepted)

1. **Avinash Parashar (2016)**, Molecular dynamics based study of an irradiated single crystal of niobium. Journal of Nuclear Materials (**Under review**)
2. Rajasekaran G., **Avinash Parashar, (2016)**, Anisotropic compressive response of Stone-Thrower-Wales defects in graphene: A molecular dynamics study. Materials research express, 9, 095015
3. Rajesh Kumar, **Avinash Parashar, (2016)** Effects of hydrogenation and semi-hydrogenation on mechanical properties of h-BN: a reactive force field study. *The Journal of Physical Chemistry C* (**Published Online**)
4. Muse Degefe, **Avinash Parashar, (2016)** Effect of non-bonded interactions on the failure mechanism of defective graphene sheet. *Material Research Express* 4, 045009

5. Rajasekaran G., Rajesh Kumar, **Avinash Parashar**, (2016) Molecular dynamics based simulations to study the effect of modified cut-off function for Tersoff potential on estimating mechanical properties of graphene. *Material Research Express*, 3 , 035011
6. Rajasekaran G., **Avinash Parashar**, (2016) Molecular dynamics study on mechanical response and failure behaviour of graphene: performance enhancement via 5-7-7-5 defects. *RSC Advances*, 6, 26361-26373.
7. Rajesh Kumar, Rajasekaran G, **Avinash Parashar**, (2015) Optimised cut-off function for Tersoff like potentials for BN nanosheets: A molecular dynamics study. *Nanotechnology*, 27,085706.
8. Rajesh Kumar, Avinash Parashar (2016), Atomistic modeling of mechanical and thermal properties of BN nanofillers: a review. *Nanoscale*, 8, 22-49.
9. Rajasekaran G., **Avinash Parashar** (2016) Effect of point and line defects on the properties of graphene. *Critical reviews in solid state and materials sciences*.41, 46-70.
10. **Avinash Parashar**, Pierre Mertiny, (2013) Effect of van der Waals interaction on the fracture characteristics of graphene sheet. *Solid State Communication*. 173, 56-60.
11. **Avinash Parashar**, Pierre Mertiny, (2013) Effect of van der Waals forces on the buckling strength of multiple graphene sheets. *Computational and Theoretical Nanoscience*, 10, 2626-2630.
12. **Avinash Parashar**, Pierre Mertiny (2013) Multiscale model to study fracture toughening in graphene/polymer nanocomposites, *International Journal of Fracture*, 179, 221-228.
13. **Avinash Parashar**, Pierre Mertiny, (2013) Failure mechanism in adhesively bonded FRP pipe sections with different fibre architecture, *Composite Part B* 47, 102-106.
14. **Avinash Parashar**, Pierre Mertiny, (2013) Finite element analysis to study the effect of dimensional and geometrical parameters on the

stability of graphene sheets. *Journal of Computational and Theoretical Nanoscience*, 10, 292-296.

15. **Avinash Parashar**, Pierre Mertiny, (2012) Representative volume element to estimate buckling behavior of graphene/polymer nanocomposite. *Nanoscale Research Letters*, 7, 515. (**Highly Accessed Article**)
16. **Avinash Parashar**, Pierre Mertiny, (2012) Multiscale model to investigate the effect of graphene on the fracture characteristics of graphene/polymer nanocomposite, *Nanoscale Research Letters*, 7, 595. (**In Oct 2012 was listed among the top 20 downloaded papers**)
17. **Avinash Parashar**, Pierre Mertiny, (2012) Effect of FRP pipe scaling on its adhesive bonding strength. *Journal of Adhesion*, 88, 866-880.
18. **Avinash Parashar**, Pierre Mertiny, (2012) Study of mode I fracture of graphene sheets using atomistic based finite element modeling and virtual crack closure technique. *International Journal of Fracture*, 176,119-126.
19. **Avinash Parashar**, Pierre Mertiny, (2012) Adhesively bonded composite tubular joints: Review. *International Journal of Adhesion and Adhesives*, 38, 58-68. (**In Oct 2012 was listed among the top 5 downloaded papers**)
20. Jasjit Singh Mann, **Avinash Parashar**, Ankur Shah, N.R.Sivakumar, (2010) Numerical and experimental analysis of nanosecond pulsed laser drilling with dual frequency. *International Journal of Abrasion Technology*, 3, 141-156.
21. Ankur Shah, **Avinash Parashar**, Jasjit Singh Mann, N.R. Sivakumar, (2009) Interference assisted laser induced forward transfer for structured patterning. *The Open Applied Physics*, 2, 49-52.
22. **Avinash Parashar**, Jasjit Singh Mann, Ankur Shah, N.R.Sivakumar, (2009) Numerical and experimental study of interference based micromachining of stainless steel. *Journal of Laser Micro/Nano Engineering*, 4, 124-127.

23. Jasjit Singh Mann, **Avinash Parashar**, Ankur Shah, N.R.Sivakumar, (2009) Optical setup with high power transmission for creating gratings at the focusing length. *Journal of Modern Optics*, 56, 1341-1347.
24. **Avinash Parashar**, Jasjit Singh Mann, Ankur Shah, N.R.Sivakumar, (2009) Interference based marking method for toric contact eye lens inserts. *Journal of Modern Optics*, 56, 855-862.
25. **Avinash Parashar**, Ankur Shah, Muthukumaran Packirisamy, N.R.Sivakumar, (2007) Three cavity tunable MEMS Fabry Perot interferometer. *Journal of Sensors*, 7, 3071-3083. (**Published in special issue on modeling, testing and reliability issues in MEMS engineering**)

Conference proceeding

1. **Avinash Parashar**, Pierre Mertiny. Impact of scaling on fracture strength of adhesively bonded fibre reinforced polymer piping. *Procedia Engineering*. **2011**; 10 : 455-459.
2. **Avinash Parashar**, Pierre Mertiny. Challenges in joining thermoset composite piping. *International pipeline conference*.**2010** Calgary -IPC2010-31297
3. Pierre Mertiny, Mohamed T. Bashar, **Avinash Parashar**, Kulwinder Juss. Technological advances for improved performance and operation of fiber reinforced polymer piping. *ASME Pressure Vessels & Piping Conference*.**2010**
4. **Avinash Parashar**, Ankur Shah, N.R.Sivakumar. *Laser micromachining for biomedical applications*. *International Conference LPM*.**2008** Quebec.
5. **Avinash Parashar**, Mukesh K. Meena. Robotics and artificial intelligence. *National Level Conference DOKINCE*.**2001**. India.
6. **Avinash Parashar**, Ashutosh Pandey. Space Robotics. *National Level Conference PRODIGY*. **2001**. India