

## Sudharshan Phani, Pardhasaradhi

Scientist F, Centre for Engineered Coatings & Advanced Nanomechanical Characterization  
Centre, International Advanced Research Centre for Powder Metallurgy & New Materials  
(ARCI), Balapur P.O., Hyderabad, Telangana, India, 500005  
Ph: +91-40-24452418; Email: spphani@arci.res.in; spphani@yahoo.com

### Education

PhD, Materials Science and Engineering, University of Tennessee, Knoxville, USA	2008-2012
B.Tech, Mechanical Engineering, Indian Institute of Technology, Madras, India	1999-2003

### Professional experience

Adjunct Professor, University of Hyderabad, India	2023 - present
Scientist F, ARCI, Hyderabad, India	2021 - present
Scientist E, ARCI, Hyderabad, India	2016 - 2021
Staff Scientist, Nanomechanics Inc., Oak Ridge, USA	2013 - 2016
Graduate research assistant, EFRC, ORNL, Oak Ridge, USA	2011 - 2012
Graduate research assistant, Univ. of Tennessee, Knoxville, USA	2008 - 2012
Visiting scientist, Laboratoire SIMaP – GPM2, INPG, Grenoble, France	2007 - 2007
Scientist B, ARCI, Hyderabad, India	2004 - 2008

### Awards and honors

- Recognized as **Early Career Scholars in Materials Science 2020**, by Materials Research Society.
- Developed high speed mapping tool **NanoBlitz3D+** and launched globally in San Antonio, TX
- **3 invited feature papers** in Journal of Materials Research 2018 featuring the first report on nanomechanical characterization of pure Lithium films
- The work on pure Lithium films has been recognized by **Department of Energy (DOE)**, USA and widely acknowledged / published by several science reporting agencies
- Recipient of **Stainless steel indenter award 2014**, for excellence in R&D at Nanomechanics Inc
- Won **Best poster award** at Gordon Research Conference on Thin films and mechanical properties, 2014
- Recipient of **Stainless steel indenter award 2013**, for excellence in R&D at Nanomechanics Inc
- Selected for inclusion in 2009 edition of **Who's Who in the World®** by Marquis, USA
- Recipient of **Joint Institute for Advanced Materials (JIAM) fellowship**
- Recipient of **National Merit Scholarship** for excellence in twelfth grade, 1999
- Won Special award in **Regional Mathematical Olympiad (RMO), 1997**

## Peer-reviewed publications (last 5 years)

1. Chetan Singh, Hariharan Krishnaswamy, PS Phani, Fu Chian Chen, Dinh-Phuc Tran, Chih Chen, Jayant Jain, Influence of Additives Induced Microstructural Parameters on Mechanical Behavior of (111)-oriented Nanotwinned Microcrystalline Copper, *Materials Science & Engineering - A*, (2023), 145150
2. Aditya Prakash, Tawqeer Nasir Tak, Namit N. Pai, Harita Seekala, S.V.S. Narayana Murty, P.S. Phani, Sivasambu Mahesh, P.J. Guruprasad, Indradev Samajdar, Inception of macroscopic shear bands during hot working of aluminum alloys, *International Journal of Plasticity*, (2023), 166, 103632
3. Deekshith G Kalali, Harita Seekala, P Sudharshan Phani, K Bhanu Sankara Rao, Koteswararao V Rajulapati, High speed nanoindentation aided correlative study between local mechanical properties and chemical segregation in equiatomic MoNb and MoNbTi alloys, *Journal of Materials Research*, (2023)
4. LA Boatner, CB Finch, WE Brundage, JA Kolopus, GR Gruzalski, KE Johanns, P Sudharshan Phani, GM Pharr, WC Oliver, Synthesis and characterization of metal carbides for nanoindentation tip applications, *Journal of Applied Physics*, (2023), 133, 095107
5. Harita Seekala, Lavakumar Bathini, Nitin P Wasekar, Hariharan Krishnaswamy, P Sudharshan Phani, A unified approach to quantify the material and geometrical effects in indentation size effect, *Journal of Materials Research*, (2023), 38, 1740
6. B.L. Hackett, P. Sudharshan Phani, C.C. Walker, W.C. Oliver and G.M. Pharr, Advances in the measurement of hardness at high strain rates by nanoindentation, *Journal of Materials Research*, (2023), 38, 1163
7. Soudip Basu, Balila Nagamani Jaya, Harita Seekala, P Sudharshan Phani, Anirban Patra, Sarbari Ganguly, Monojit Dutta, Indradev Samajdar, Correlative characterization and plasticity modeling of microscopic strain localizations in a dual phase steel, *Materials Characterization*, (2023), 197, 112704
8. P. Sudharshan Phani, B.L. Hackett, C.C. Walker, W.C. Oliver and G.M. Pharr, High strain rate nanoindentation testing: Recent advancements, challenges and opportunities, *Current Opinion in Solid State and Materials Science*, (2023), 27, 101054
9. P. Sudharshan Phani, B.L. Hackett, C.C. Walker, W.C. Oliver and G.M. Pharr, On the measurement of hardness at high strain rates by nanoindentation impact testing, *Journal of Mechanics and Physics of Solids*, (2023), 170, 105105
10. S Janakiram, P. Sudharshan Phani, G Ummethala, SK Malladi, J Gautam, LAI Kestens, Insights on early recovery kinetics in ferrite-pearlite cold rolled high strength sheet steels, *Materials Characterization* (2022), 193, 112332
11. Kali Prasad, Vikram Balaji, Hariharan Krishnaswamy, P Sudharshan Phani, Pierpaolo Carlone, Rigorous analysis and pragmatic guidelines in estimating strain rate sensitivity using stress relaxation test, *Mechanics of Materials*, (2022), 168, 104279
12. P. Sudharshan Phani, W.C. Oliver and G.M. Pharr, Influences of elasticity on the measurement of power law creep parameters by nanoindentation, *Journal of Mechanics and Physics of Solids*, (2021), 104527
13. P. Sudharshan Phani, W.C. Oliver and G.M. Pharr, On the effective load during nanoindentation creep testing with continuous stiffness measurement (CSM), *Journal of Materials Research*, (2021),

14. Naveen Chavan, P. Sudharshan Phani, M. Ramakrishna, L. Venkatesh, Prita Pant and G. Sundararajan, Role of stacking fault energy (SFE) on the high strain rate deformation of cold sprayed Cu and Cu–Al alloy coatings, *Materials Science and Engineering-A* (2021), 814, 141242
15. Deekshith G.Kalali, Sairam Antharam, Mohsin Hasan, P.Sai Karthik, P. Sudharshan Phani, K. Bhanu Sankara Rao, Koteswararao V.Rajulapati, On the origins of ultra-high hardness and strain gradient plasticity in multi-phase nanocrystalline MoNbTaTiW based refractory high-entropy alloy, *Materials Science and Engineering-A* (2021), 812, 141098
16. Fereshteh Mallakpour, Erik G. Herbert, P. Sudharshan Phani, Stephen A. Hackney, Length Scale Dependent Stress Relief Mechanisms in Indium at High Homologous Temperatures, *Journal of Materials Research*, (2021), 36, 2444, **Invited Paper**
17. P. Sudharshan Phani, W.C. Oliver and G.M. Pharr, Measurement of hardness and elastic modulus by load and depth sensing indentation: Improvements to the technique based on continuous stiffness measurement, *Journal of Materials Research*, (2021), 36, 2137, **Invited Paper**
18. EM Rossi, P Sudharshan Phani, R Guillemet, Julie Cholet, Doriane Jussey, WC Oliver, M Sebastiani, A novel nanoindentation protocol to characterize surface free energy of superhydrophobic nanopatterned materials, *Journal of Materials Research*, (2021), 36, 2357, **Invited Paper**
19. S Janakiram, PS Phani, G Ummethala, SK Malladi, J Gautam, LAI Kestens, New insights on recovery and early recrystallization of ferrite-pearlite banded cold rolled high strength steels by high speed nanoindentation mapping, *Scripta Materialia*, (2021), 194, 113676
20. G Kommineni, Z Alam, P.Sudharshan Phani, R Sarkar, VVS Prasad, BR Golla., Influence of Ti and Zr alloying elements on microstructure and micromechanical properties of near-eutectic Nb-18.7Si alloy, *Materials Characterization*, (2021), 110723
21. P. Sudharshan Phani, W.C. Oliver and G.M. Pharr, An experimental assessment of methods for mitigating plasticity error during nanoindentation with continuous stiffness measurement, *Materials & Design*, 194 (2020), 108924
22. P. Sudharshan Phani, W.C. Oliver and G.M. Pharr, Understanding and modeling plasticity error during nanoindentation with continuous stiffness measurement, *Materials & Design*, 194 (2020), 108923
23. Shaik Mubina, P Sudharshan Phani, Asit Kumar Khanra and B.P. Saha, A nanoindentation based study to evaluate the effect of carbon nanofibers on the mechanical properties of SiC composites, *Composite Interfaces* (2020), 28, 363
24. LA. Boatner, B. C. Chakoumakos, P. Sudharshan Phani, S. N. Dryepondt, A Shaw, J Qu, AEM Rossy, MA McGuire, JA Kolopus, E Lara-Curzio, Cryo-quenched Fe–Ni–Cr alloy decorative steel single crystals II: Alloy phases, structure, hardness, tensile, tribological, magnetic and electronic properties, *Journal of Alloys and Compounds*, 835, (2020), 155169
25. P. Sudharshan Phani and W.C. Oliver, Critical examination of experimental data on strain bursts (pop-in) during spherical indentation, *Journal of Materials Research*, 35, (2020), 1028, **Invited Feature Paper**
26. Naveen Chavan, M.V. Kumar, P. Sudharshan Phani, P. Pant and G. Sundararajan, Influence of Nozzle Throat Cross Section on Microstructure and Properties of Cold Sprayed Coatings, *Journal of Thermal Spray Technology*, 28, (2019), 1718

27. B. Vignesh, W.C. Oliver, G. Siva Kumar and P. Sudharshan Phani, Critical assessment of high speed nanoindentation mapping technique and data deconvolution on thermal barrier coatings, *Materials and Design*, 181 (2019), 108084
28. P. Sudharshan Phani and W.C. Oliver, A critical assessment of the effect of indentation spacing on the measurement of hardness and modulus using instrumented indentation testing, *Materials and Design*, 164 (2019), 107563
29. Bolla Reddy Bodapati, P Sudharshan Phani, PP Bhattacharjee and G Sundararajan, On the Constraint Factor and Tabor Coefficient Pertinent to Spherical Indentation, *Transactions of the Indian Institute of Metals*, 71 (2018), 2893-2901
30. Bolla Reddy Bodapati, P Sudharshan Phani, PP Bhattacharjee and G Sundararajan, Uniaxial compression behaviour of porous copper: Experiments and modelling, *Materials Today communications*, 16 (2018), 320-329
31. J.J. Roa, P. Sudharshan Phani, W.C. Oliver and L. LLanes, Mapping of mechanical properties at microstructural length scale in WC-Co cemented carbides: Assessment of hardness and elastic modulus by means of high speed massive nanoindentation and statistical analysis, *International journal of refractory metals and hard materials*, 75 (2018), 211-217.
32. E. G. Herbert, S.A. Hackney, N.J. Dudney and P. Sudharshan Phani, Nanoindentation of high-purity vapor deposited lithium films: A mechanistic rationalization of the transition from diffusion to dislocation-mediated flow, *Journal of Materials Research*, 33 (2018), 1361-1368 (**Invited Feature paper**)
33. E. G. Herbert, S.A. Hackney, N.J. Dudney and P. Sudharshan Phani, Nanoindentation of high-purity vapor deposited lithium films: A mechanistic rationalization of diffusion-mediated flow, *Journal of Materials Research*, 33 (2018), 1347-1360 (**Invited Feature paper**)
34. E. G. Herbert, S.A. Hackney, N.J. Dudney and P. Sudharshan Phani, Nanoindentation of high-purity vapor deposited lithium films: The elastic modulus, *Journal of Materials Research*, 33 (2018), 1335-1346 (**Invited Feature paper**)
35. P.S. Babu, P.C. Rao, A. Jyothirmayi, P. Sudharshan Phani, L.R. Krishna and D.S. Rao, Evaluation of microstructure, property and performance of detonation sprayed WC-(W,Cr)2C-Ni coatings, *Journal of Surface and Coatings Technology*, 335 (2018), 345-354