**Dr. Kirit N. Lad**
***Professor***
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kiritlad@yahoo.com

**Areas of Research**

- Theoretical modelling and computer simulation studies of structure, dynamics and thermodynamics of metallic glass-forming liquids
- Phase transformation (glass transition and crystallization) in metallic glasses

## Academic Qualifications

- Ph. D. (Applied Physics), 2004, The M. S. University of Baroda, Vadodara
- M. Sc. (Applied Physics), 1997, The M. S. University of Baroda, Vadodara
- B. Sc. (Physics), 1995, Veer Narmad South Gujarat University, Vadodara

## Experience

- **Professor** (June 2018 – Till Date)
  Department of Physics, S. P. University, Vallabh Vidyanagar.
- **Associate Professor** (September 2013–May 2018)
  Applied Physics Department, M. S. University of Baroda, Vadodara
- **BOYSCAST Fellow** (June 2010 – June 2011)
  Science et Ingenierie des Materiaux et Procedes, UMR, CNRS-INP Grenoble, France.
- **Assistant** Professor (April 2008 – September 2013)
  Applied Physics Department, M. S. University of Baroda, Vadodara.
- **Lecturer** (Feb. 14, 2008 – Apr. 9, 2008)
  Department of Physics, Bhavnagar University, Bhavnagar.
- **Lecturer (Temp)**, (2003-2008)
  Applied Physics Department, M. S. University of Baroda, Vadodara.
- **Teaching Assistant** (2001-2002)
  Applied Physics Department, M. S. University of Baroda, Vadodara.
- **UGC Project** Fellow(1999-2001)
  Applied Physics Department, M. S. University of Baroda, Vadodara.

## Research Projects

1) Study of microalloying effects on the atomic-level structure, dynamics, glass formation andphysical properties of Zr-based bulk metallic glass-forming alloys.
   *Amount*: Rs 22.4444 lakh
   *Period* : 2019-2022 (3 years)
   *Funding Agency*: SERB, DST, New Delhi

2) Molecular dynamics (MD) simulation of the glass formation & crystallization processes in bulk metallic glasses.
   *Amount* : Rs. 4.08 lakh
   *Period* : 2007-2010 (3 years)
   *Funding Agency*: DST, New Delhi

## Research Publications

1) *Correlation between entropy and glass-forming ability of Cu-Zr and Cu-Zr-Al alloys.*
   MK Patel, I Malek, MC Shah, KN Lad, A Pratap
   Materials Today: Proceedings (Published online 7/1/2021, in Press, in Press)
2) *Effect of Al addition on structure and dynamics of Zr-Cu-Al glass-forming alloy.*
   KN Lad, KG Soni
   Materials Today: Proceedings (Published online 2/12/2020, in Press)

3) *How closely do many-body potentials describe the structure and dynamics of Cu–Zr glass-forming alloy?*
KN Lad, N Jakse, A Pasturel
Journal of Chemical Physics **146**, 124502 (2017).
4) *Correlation between atomic-level structure, packing efficiency and glass-forming ability in Cu–Zr metallic glasses.*
KN Lad
Journal of Non-crystalline Solids **404**, 55-60 (2014)
5) *Grain Size Limit of Nanocrystalline Materials Obtained by Annealing Bulk Metallic Glasses.*
A Pratap, AT Patel, HR Shevde, KN Lad
Transactions of the Indian Ceramic Society **71**, 219-221 (2012)
6) *Signatures of fragile-to-strong transition in a binary metallic glass-forming liquid.*
KN Lad, N Jakse, A Pasturel
Journal of chemical physics **136**, 104509(2012)
7) *Glass forming ability of Ca-based bulk metallic glasses.*
AT Patel, KN Lad, A Pratap
Solid State Phenomena **171**, 121-126(2011)
8) *Iso-Conversional and Isokinetic Methods of Analysis of Non-Isothermal Crystallization in $Ti_{50}Cu_{20}Ni_{30}$ Metallic Glass.*
H Dhurandhar, TL Shanker Rao, KN Lad, A Pratap
Solid State Phenomena **171**, 107-119(2011).
9) *Kinetics of crystallization of Co-based multi-component amorphous alloy.*
H Dhurandhar, AT Patel, TLS Rao, KN Lad, A Pratap
Journal of ASTM International **7**, 1-15(2010)
10) *Kinetic Study of Crystallization Process in Metallic Glass.*
K Lad, TLS Rao, A Pratap
AIP Conference Proceedings 1249, 114-119(2010)
11) *Isokinetic and isoconversional study of crystallization kinetics of a Zr-based metallic glass.*
KN Lad, RT Savalia, A Pratap, GK Dey, S Banerjee
Thermochimica Acta **473**, 74-80(2008)
12) *Kinetic analysis of crystallization processes in amorphous 2826A (Ni36Fe32Cr14P12 B6) metallic glass.*
TLS Rao, HD Dhurandhar, KN Lad, A Pratap
Indian Journal of Pure & Applied Physics **46**, 390-393(2008)
13) *Gibbs free energy for the crystallization of metallic glass-forming alloys from an undercooled liquid.*
H Dhurandhar, TLS Rao, KN Lad, A Pratap
Philosophical Magazine Letters **88**, 239-249(2008)
14) *Thermodynamic properties of magnetic liquid metals in undercooled region.*
H Dhurandhar, T Rao, KN Lad, A Pratap
Indian Journal of Pure & Applied Physics **46**, 371-374 (2008)
15) *Gibbs free energy difference in bulk metallic glass forming alloys.*
H Dhurandhar, KN Lad, A Pratap, GK Dey
Defect and Diffusion Forum **279**, 91-96(2008)
16) *Nanocrystallization Kinetics of Amorphous Fe-Based Multicomponent Alloy by Non-Isothermal Analysis.*
T Lilly Shanker Rao, KN Lad, H Dhurandhar, A Pratap, PK Jha
Materials Science Forum **570**, 109-113(2008)
17) *Isoconversional vs. Model fitting methods.*
A Pratap, TLS Rao, KN Lad, HD Dhurandhar
Journal of Thermal Analysis and Calorimetry **89**, 399-405(2007)
18) *Kinetics of crystallization of titanium based binary and ternary amorphous alloys.*
A Pratap, TLS Rao, KN Lad, HD Dhurandhar
Journal of Non-Crystalline Solids **353**, 2346-2349(2007)
19) *Atomic dynamics in liquid alkali metals at the melting point.*
KN Lad, A Pratap
Physical Review B **73**, 054204(2006)

20) *Crystallite size estimation of elemental and composite silver nano-powders using XRD principles.*
BR Rehani, PB Joshi, KN Lad, A Pratap
Indian Journal of Pure & Applied Physics **44**, 157-161(2006)
21) *Crystallization kinetics of a multicomponent Fe-based amorphous alloy using modulated differential scanning calorimetry.*
KG Raval, KN Lad, A Pratap, AM Awasthi, S Bhardwaj
Thermochimica Acta **425**, 47-57(2005)
22) *Study of formation of nano-quasicrystals and crystallization kinetics of Zr-Al-Ni-Cu metallic glass.*
R Savalia, K Lad, A Pratap, G Dey, S Banerjee
Journal of Thermal Analysis and Calorimetry **78**, 745-751(2004)
23) *Velocity autocorrelation function for simple liquids and its application to liquid metals and alloys.*
KN Lad, A Pratap
Physical Review E **70**, 051201(2004)
24) *Kinetics of crystallization of amorphous $Cu_{50}Ti_{50}$ alloy.*
A Pratap, KN Lad, TLS Rao, P Majmudar, NS Saxena
Journal of Non-Crystalline Solids **345**, 178-181(2004)
25) *Kinetics of crystallisation of Zr20Ti20Cu60 amorphous alloy using modulated differential scanning calorimetry.*
A Pratap, KN Lad, RT Savalia, GK Dey, S Banerjee, AM Awasthi
Physics and Chemistry of Glasses **45**, 258-262(2004)
26) *Structure factors and phonon dispersion in liquid $Li_{0.61}Na_{0.39}$ alloy.*
A Pratap, KN Lad, KG Raval
Pramana **63**, 431-435(2004)
27) *Microstructural and thermoanalytical investigations of nano-phase formation in $Ti_{20}Zr_{20}Cu_{60}$ alloy.*
A Pratap, KN Lad, RT Savalia, GK Dey, S Banerjee
Materials Science and Engineering: A **375**, 767-771(2004)
28) *Estimation of Gibbs free energy difference in bulk metallic glass forming alloys.*
KN Lad, KG Raval, A Pratap
Journal of Non-Crystalline Solids **334**, 259-262(2004)
29) *Study of non-isothermal crystallization of amorphous $Cu_{50}Ti_{50}$ alloy.*
TLS Rao, KN Lad, A Pratap
Journal of Thermal Analysis and Calorimetry **78**, 769-774(2004)
30) *Phonon dispersion in amorphous Zr–Ni alloys.*
KN Lad, A Pratap
Physica B: Condensed Matter **334**, 135-146(2003)
31) *Study of concentration fluctuations in liquid Li-Na alloy.*
KN Lad, KG Raval, A Pratap
Indian Journal of Pure & Applied Physics **41**, 810-813(2003)
32) *Estimation of the free energy change on crystallization of multicomponent glass forming alloys.*
KN Lad, A Pratap, KG Raval
Journal of Materials Science Letters **21**, 1419-1422(2002)
33) *Fractal growth kinetics during crystallization of amorphous $Cu_{50}Zr_{50}$.*
K Lad, M Maaroof, KG Raval, A Pratap
Progress in Crystal Growth and Characterization of Materials **45**, 15-19(2002)
34) *Fabrication of ZnO:Al2O3 based hydrogen gas sensor.*
Proceedings of SPIE - The International Society for Optical Engineering 3975(2000)

**Research Students**

1) Kamal G. Soni
SERB Project Fellow & Ph. D. student
*Study of microalloying effects on the atomic-level structure, dynamics, glass formation and physical properties of Zr-based bulk metallic glass-forming alloys.*

2) Gaurav Bhabhor
Ph. D. student
*Molecular and Mesoscale Modelling of Human Red Blood Cell Membrane & its Dynamics*

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| **Participation and Presentations in Conferences/Seminars/Workshops** |
| Invited Talks : 06<br>Oral Presentations : 09<br>Poster Presentations : 08 |