

## Curriculum Vitae

**Dr. Awadhesh Kumar Dubey**

*Assistant Professor*

Department of Pure and Applied Physics

Guru Ghasidas Vishwavidyalaya

(A Central University),

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### Personal Details

Date of Birth : 25 December, 1981

Nationality : Indian

Marital Status : Married

Languages Known : Hindi and English

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### Research Interests

My research interest focuses on theoretical and computational *soft condensed matter physics* which includes:

1. Interface Motion in Disordered Media
2. Dynamical Properties of Granular Materials
3. Study of Amorphous Systems
4. Phase Transformations(Passive & Active Systems)

### Academic Details

**PhD :**

**Thesis Title :** *Clustering and Aggregation in Far-from-Equilibrium Systems*

School of Physical Sciences(SPS), Jawaharlal Nehru University(JNU), New Delhi, INDIA, 2013.

**Supervisor :** Prof. Sanjay Puri, JNU, New Delhi, INDIA.

**MSc(Physics) :** School of Physical Sciences(SPS), JNU, New Delhi, INDIA.

**BSc(PCM) :** VBS Purvanchal University, Jaunpur, Uttar Pradesh, INDIA.

## National Tests Qualified

1. Qualified ‘**National Eligibility Test**’ (**NET**) for lectureship with junior research fellowship (**JRF**), conducted by CSIR, INDIA (2008).
2. Awarded senior research fellowship(**SRF**), CSIR, India (2010-2013).
3. Qualified ‘**Graduate Aptitude Test in Engineering**’ (**GATE**) conducted by IITs, INDIA (2006).

## Work History

### Academics

1. **October, 2022 onwards**

#### **Assistant Professor**

Department of Pure and Applied Physics

**Guru Ghasidas Vishwavidyalaya**

(A Central University),

Koni, Bilaspur-495009, Chhattisgarh, INDIA.

2. **February, 2022 to September, 2022**

#### **Assistant Professor**

Department of Physics, School of Applied and Life Sciences(SALS)

**Uttaranchal University**, Dehradun, Uttarakhand, INDIA.

3. **February, 2017 to February, 2020**

#### **Assistant Professor**

Department of Physics under School of Engineering and Technology

**Central University of Haryana**, Mahendergarh, Haryana, INDIA.

### Postdoctoral Research

1. **November, 2016 to February, 2017**

*Research Associate*

School of Physical Sciences

**Jawaharlal Nehru University(JNU)**, New Delhi, INDIA.

2. **July, 2014 to July, 2016**

*Postdoctoral Fellow*

Department of Chemical Physics

**Weizmann Institute of Science**, Rehovot, ISRAEL.

3. **March, 2013 to March, 2014**

*Postdoctoral Fellow*

CNRS Laboratoire FAST

**University of Paris-SUD**, Orsay, FRANCE.

4. **August, 2012 to August, 2013**

*Senior Research Fellow*

School of Physical Sciences (SPS)

**Jawaharlal Nehru University(JNU)**, New Delhi, INDIA.

## Publications

1. *Scaling theory of mechanical properties of amorphous nano-films*  
**Awadhesh K. Dubey**, H. George E. Hentschel, Prabhat K. Jaiswal, Chandana Mondal, Yoav G. Pollack, Itamar Procaccia  
*Thin Solid Films*, **669**, 80 (2019).
2. *Avalanches dynamics in reaction fronts in disordered flows*  
T. Chevalier, **A. K. Dubey**, S. Atis, A. Rosso, D. Salin, and L. Talon  
*Phys. Rev. E*, **95**, 042210 (2017).
3. *Dynamical scaling for underdamped strain order parameters quenched below first-order phase transitions*  
N. Shankaraiah, **Awadhesh K. Dubey**, Sanjay Puri and Subodh R. Shenoy  
*Phys. Rev. B* **94**, 224101 (2016).
4. *Statistics of Plastic Events in Post-Yield Strain-Controlled Amorphous Solids*  
**Awadhesh K. Dubey**, H. George E. Hentschel, Itamar Procaccia and Murari Singh  
*Phys. Rev. B* **93**, 224204 (2016).
5. *Elasticity in Amorphous Solids: Nonlinear or Piece-Wise Linear ?*  
**Awadhesh K. Dubey**, Itamar Procaccia, Carmel ABZ Shor, and Murari Singh  
*Phys. Rev. Lett.* **116**, 085502 (2016).
6. *Modeling Barkhausen Noise in Magnetic Glasses with Dipole-Dipole Interactions*  
**Awadhesh K. Dubey**, H. George E. Hentschel, Prabhat K. Jaiswal, Itamar Procaccia, Chandana Mondal, and Bhaskar Sen Gupta  
*EPL (Europhysics Letters)*, **112**, 1 (2015).
7. *Experimental Evidence for Three Universality Classes for Reaction Fronts in Disordered Flows*  
Severine Atis, **Awadhesh K. Dubey**, Dominique Salin, Laurent Talon, Pierre Le Doussal and Kay Jorg Wiese  
*Phys. Rev. Lett.* **114**, 234502 (2015).
8. *Strong pinning of propagation fronts in adverse flow*  
Thomas Gueudre, **Awadhesh K. Dubey**, Laurent Talon and Alberto Rosso  
*Phys. Rev. E* **89**, 041004(R) (2014).
9. *Velocity distribution function and effective restitution coefficient for a granular gas of viscoelastic particles*  
**Awadhesh K. Dubey**, Anna Bodrova, Sanjay Puri and Nikolai Brilliantov  
*Phys. Rev. E* **87**, 062202 (2013).
10. *Intermediate Regimes in Granular Brownian Motion: Superdiffusion and Subdiffusion*  
Anna Bodrova, **Awadhesh K. Dubey**, Sanjay Puri and Nikolai Brilliantov  
*Phys. Rev. Lett.* **109**, 178001 (2012).

## Computational Skills

1. **Operating Systems** : Unix, GNU/Linux, MS DOS, Windows.
2. **Programming** :
  - (a) C, C++, Fortran, UNIX Shells.
  - (b) MPI and OpenMP.
  - (c) Matlab and Mathematica.
3. **Advanced Simulation Techniques** :
  - (a) **Molecular Dynamics (MD) Simulations**
    - (i) Time-driven MD  
*Applied on* :  
Binary mixtures : Particles interact via Lennard Jones (LJ) potential.
    - (ii) Event-driven MD  
*Applied on* :  
Study of a force-free and a heated granular gas :
      1. Low-density viscoelastic granular gases.
      2. A granular gas of rough particles.
  - (b) **Monte-Carlo Simulations**  
*Applied on* :
    1. Binary-Mixtures (*Kawasaki Dynamics*).
    2. Ferromagnets (*Glauber Dynamics*).
  - (c) **Lattice-Boltzmann Simulations**  
*Applied on* :
    1. Phase-separation kinetics of binary-fluid mixtures.
    2. To analyze the different regimes of propagation of an autocatalytic reaction front in heterogeneous porous media
  - (c) **Langevin Simulations**  
*Applied on* : Kinetics of phase separation :
    1. Binary mixtures and binary-fluid mixtures.
    2. Thin-films.
    3. Austenite-martensite phase transformations.
4. **Other Activities** :
  - (a) “*System Administrator*”, Ph.D. Computational Lab, School of Physical Sciences, JNU (2008-2009).
  - (b) “*System Administrator*”, *Gibbs* cluster, School of Physical Sciences, JNU (2010-2012).

## Teaching Details

### **Courses Taught:**

#### **(a) Post Graduate Level**

1. Statistical Mechanics
2. Advanced Statistical Mechanics
3. Nonlinear Dynamics
4. Mathematical Physics
5. Solid State Physics
6. Computational Physics

#### **(b) Undergraduate Level**

7. Engineering Physics-I
8. Engineering Physics-II
9. Waves, Optics & Quantum Mechanics
10. Mechanics
11. Semiconductor Physics

## M.Sc. Dissertations Supervision

1. Twinning and Motion of Interfaces in 2D Austenite-Martensite Phase Transformations: A Numerical Study  
(**Ayushi Jain**, M. Sc., 2018, Central University of Haryana, India.)
2. Glass Formation and Statistical Analysis of Plastic Events in Steady State: A Molecular Dynamics Simulation  
(**Himanshu Nautiyal**, M. Sc., 2018, Central University of Haryana, India.)
3. Evolution and Growth of Domains in Critical and Off-Critical Binary Mixtures  
(**Anita Bagraniya**, M. Sc., 2018, Central University of Haryana, India.)
4. Study of Front Propagation in Two Dimensions using KPZ and QKPZ Equations  
(**Mehar Ud Din**, M. Sc., 2018, Central University of Haryana, India.)
5. Preparation and Properties of A Computational Glass: A Molecular Dynamics Simulation  
(**Sunil Joshi**, M. Sc., 2019, Central University of Haryana, India.)
6. Revisiting Interface Growth Models: QKPZ and KPZ Equations  
(**Anurag Bhandari**, M. Sc., 2019, Central University of Haryana, India.)
7. Study of Traffic Congestion Using A Dynamical Model  
(**Darshana**, M. Sc., 2019, Central University of Haryana, India.)

## B.Sc. Dissertations Supervision

1. Revisiting Kinetics of Phase Separation in Binary Mixtures  
(**Mohammad Wamis**, B. Sc., 2022, Uttarakhand University, Dehradun, India.)
2. Perovskite Materials and its Applications  
(**Shivraj Singh**, B. Sc., 2022, Uttarakhand University, Dehradun, India.)

## Academic Responsibilities Undertaken(Other than Teaching)

1. **BOS Member**, Department of Physics, Central University of Haryana, India.
2. **Physics Lab in-charge**, Department of Physics under School of Engineering & Technology (SoE&T), Central University of Haryana, India.
3. **Organizing Secretary**, International Conference on "Trends in Computational & Cognitive Engineering(TCCE)", 2019, SoE&T, Central University of Haryana, India.
4. **Food Committee Member**, "Association of Microbiologists of India(AMI)" Meeting 2019, Central University of Haryana, India.
5. **BOS Member Secretary**, Department of Physics, School of Applied & Life Sciences(SALS), Uttarakhand University, Dehradun, India.
6. **Joint Organizing Secretary**, Faculty Development Program(FDP) on "Advances in Computational Sciences & Technology", 2022, SALS, Uttarakhand University, Dehradun, India.
7. **Member of Food Committee and Evaluation Committee**, Hackthon 2022, UIT, Uttarakhand University, Dehradun, India.

## Presentations

1. Oral at “Statistical Physics Out of Equilibrium”, Paris, France (2007).

**Title :***Kinetics of Phase Separation (Binary Mixtures).*

2. Oral at “SERC School”, IIT, Guwahati (2008).

**Title :***Lattice Boltzmann Simulations of Binary Fluid Mixtures.*

3. Oral at “Fifth Dynamics Day”, SPS, JNU, New Delhi (2009).

**Title :***Free Cooling of a Granular Gas.*

4. Poster at “Fundamental Problems in Statistical Physics”, (FPSP) XII, Leuven, Belgium (2009).

**Title :***Free Cooling of Granular Gases of Viscoelastic Particles.*

**Awadhesh Kumar Dubey**, Anna Bodrova, Sanjay Puri and Nikolai Brilliantov  
5. Poster at “SPS March Meeting on Soft Matter Physics”, SPS, JNU, New Delhi, India (2010).

**Title :***Cooling and Brownian Motion in Viscoelastic Granular Gases.*

**Awadhesh Kumar Dubey**, Anna Bodrova, Sanjay Puri and Nikolai Brilliantov  
6. Poster at “Dynamics of Phase Transformations”, JNCASR, Bangalore, India (2011).

**Title :***Growth and Coarsening Dynamics of a Triple Well Landau Free Energy.*

**Awadhesh Kumar Dubey**, Sanjay Puri and Subodh R. Shenoy