

# CURRICULUM VITAE

## Personal Data

Name : **Chandan Dasgupta**

Address : Department of Physics, Indian Institute of Science, Bangalore-560 012, India.

Telephone : (91)(80)2293 3278 (office); (91)(80)2334 5417 (home).

Electronic Mail: cdgupta@iisc.ac.in

Date of Birth : December 17, 1951

Nationality : Indian

## Education

- Bachelor of Science with Honours in Physics from University of Calcutta (1970).
- Master of Science in Physics from Delhi University (1973).
- Ph.D. in Physics from University of Pennsylvania (1978); Thesis supervisor: Professor A. Brooks Harris.

## Present Employment

Honorary Professor (Emeritus) in the Department of Physics, Indian Institute of Science, Bangalore, India (2017 - present).

Simons Visiting Professor at the International Centre for Theoretical Sciences, Bangalore, India (2017 - present).

## Previous Employment

- Postgraduate Research Physicist, University of California, San Diego (1978-80).
- Postdoctoral Fellow, Harvard University (1980-81).
- Assistant Professor, University of Minnesota (1981-83, 1984-86).
- Visiting Assistant Professor, Indian Institute of Science (1983-84).
- INSA Research Fellow, Indian Institute of Science (1986-87).
- Assistant Professor, Indian Institute of Science (1987-89).
- Associate Professor, Indian Institute of Science (1989-95).
- Professor, Indian Institute of Science (1995-2017).
- Visiting Professor, University of Minnesota (1994-1995).
- Visiting Professor, University of Maryland (2002-2003).
- Dean, Undergraduate Programme, Indian Institute of Science (2010-14).

## **Honors and Awards**

- Warner Teutsch Memorial Prize, University of Pennsylvania (1974).
- Research Fellowship from the Alfred P. Sloan Foundation (1984-87).
- Research Fellowship from the Indian National Science Academy (1986-89).
- Elected Fellow of Indian Academy of Sciences in 1992.
- DAE - Raja Ramanna Prize, 1999.
- Elected Fellow of Indian National Science Academy in 1999.
- Elected Fellow of National Academy of Sciences, India in 2000.
- Prof. Rustum Choksi Award of Indian Institute of Science for Excellence in Research in Science, 2004.
- J. C. Bose National Fellowship of the Department of Science and Technology, Government of India (2006 - 2019).
- Elected Fellow of the World Academy of Sciences (TWAS) in 2007.
- UGC National Hari Om Ashram Trust Award, entitled Sir C.V. Raman Award for Research in Physical Sciences (award presented in 2010).
- Satyendranath Bose Medal for Physics, awarded by the Indian National Science Academy (2018).
- SERB Distinguished Fellowship of the Department of Science and Technology, Government of India (2020 - present).

## **Recent Scientific Collaborations:**

Oriol T. Valls (University of Minnesota, USA).

Nir S. Gov (Weizmann Institute, Israel).

Bulbul Chakraborty (Brandeis University, USA).

Mayank R. Mehta (University of California, Los Angeles, USA)

Srikanth Sastry (Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India).

Smarajit Karmakar (TIFR Centre for Interdisciplinary Sciences, Hyderabad, India).

Madan Rao (National Centre for Biological Sciences, Bangalore, India).

Abhishek Dhar (International Centre for Theoretical Sciences, Bangalore, India).

Sarika Maitra Bhattacharyya (National Chemical Laboratory, Pune, India).

Amit Ghosal (Indian Institute of Science Education and Research, Kolkata, India).

Pinaki Chaudhuri (Institute for Mathematical Sciences, Chennai, India).

### **Guidance of Ph.D. and Masters Students:**

Ph.D. degree: 17 students at University of Minnesota and Indian Institute of Science

M.S. degree: 6 students at Indian Institute of Science

### **Recent Ph.D. Advisees:**

S. Karmakar (Faculty Member at TIFR Centre for Interdisciplinary Studies, Hyderabad, India).

B. Mukherjee (Research Scientist at Sheffield University, UK).

P. Chaudhuri (Faculty Member at Institute for Mathematical Sciences, Chennai, India).

S. Banerjee (Faculty Member at Indian Institute of Science, Bangalore, India).

D. Chakraborty (Program Lead, Communications, Centre for Cellular and Molecular Platforms, Bangalore, India).

H. Kumar (Faculty Member at Indian Institute of Technology, Bhubaneswar, India).

T. Mandal (Faculty Member at Indian Institute of Technology, Kanpur, India.).

R. Mandal (Marie Skłodowska-Curie Individual Fellow at Georg-August University, Gottingen, Germany).

### **Recent Postdoctoral Fellows Supervised:**

S.M. Kamil, Faculty Member at Shiv Nader University, Noida, Uttar Pradesh, India.

Awaneesh Singh, Faculty Member at Indian Institute of Technology (BHU), Varanasi, India.

S. Saw, Postdoctoral Fellow at Roskilde University, Roskilde, Denmark.

S. Chakrabarti, Faculty Member at Acharya Prafulla Chandra College, West Bengal, India.

### **Research Visits and Conferences**

Sabbatical visits to University of Minnesota (1994-95) and University of Maryland (2002-03).

Attended and gave invited talks at many international conferences and workshops, including those at Isaac Newton Institute for Mathematical Sciences, University of Cambridge, UK (2008), Lorentz Center, Leiden, Holland (2008), Kavli Institute for Theoretical Physics China, Beijing, China (2008), Kavli Institute of Theoretical Physics, Santa Barbara, USA (2010 and 2018), March Meeting of the American Physical Society, Dallas, USA (2011), Abdus Salam ICTP, Trieste, Italy (2012), and Galileo Galilei Institute of Theoretical Physics, Florence, Italy (2019).

## Publications

Number of publications in refereed journals: 167. Some of these papers have been published in the most prestigious journals in Dasgupta's area of research [**25 papers in Physical Review Letters, 2 papers in the Proceedings of the National Academy of Sciences (USA), 1 paper in Nature Communications, 1 paper in Annual Review of Condensed Matter Physics, 1 paper in Reports on Progress in Physics, 3 papers in ACS Nano, one paper in Accounts of Chemical Research, 70 papers in Physical Review B and E**].

Citation information from Google Scholar:

[<https://scholar.google.co.in/citations?user=gxk0AN0AAAAAJ&hl=en>]

**Total number of citations: 7289; h-index: 43**

### List of principal publications:

1. A. B. Harris, T. C. Lubensky, W. K. Holcomb and C. Dasgupta (1975), **Renormalization group approach to percolation problems**, Phys. Rev. Lett. **35**, 327.
2. C. Dasgupta and S. K. Ma (1980), **Low-temperature properties of the random Heisenberg antiferromagnetic chain**, Phys. Rev. B **22**, 1305.
3. C. Dasgupta and B. I. Halperin (1981), **Phase transition in a lattice model of superconductivity**, Phys. Rev. Lett. **47**, 1556.
4. C. Dasgupta (1985), **Monte Carlo study of the nematic-to-smectic-A transition**, Phys. Rev. Lett. **55**, 1771.
5. A. Chakrabarti and C. Dasgupta (1985), **Phase transition in the Ruderman-Kittel-Kasuya-Yosida model of spin-glass**, Phys. Rev. Lett. **56**, 1404.
6. M. H. Lau and C. Dasgupta (1989), **Numerical investigation of the role of topological defects in the three-dimensional Heisenberg transition**, Phys. Rev. B **39**, 7212.
7. C. Dasgupta, A. V. Indrani, S. Ramaswamy, and M. K. Phani (1991), **Is there a growing correlation length near the glass transition?**, Europhys. Lett. **15**, 307.
8. S. Sengupta, C. Dasgupta, H. R. Krishnamurthy, G. I. Menon and T. V. Ramakrishnan (1991), **Freezing of the flux liquid in high- $T_c$  superconductors: a density functional approach**, Phys. Rev. Lett. **67**, 3444.
9. C. Dasgupta (1992), **Glass transition in the density functional theory of freezing**, Europhys. Lett. **20**, 131.
10. G. I. Menon and C. Dasgupta (1994), **Effects of pinning disorder on the correlations and freezing of the flux liquid in layered superconductors**. Phys. Rev. Lett. **73**, 1023.

11. C. Dasgupta, J. M. Kim, M. Dutta and S. Das Sarma (1997), **Instability, intermittency and multiscaling in discrete growth models of kinetic roughening**, Phys. Rev. E **55**, 2235.
12. C. Dasgupta and O. T. Valls (2001), **Vortex Lattice Melting in Layered Superconductors with Periodic Columnar Pins**, Phys. Rev. Lett. **87**, 257002; (E) Phys. Rev. Lett. **89**, 049901.
13. D. B. Dougherty, I. Lyubinetzky, E. D. Williams, M. Constantin, C. Dasgupta, and S. Das Sarma (2002), **Experimental Persistence Probability for Fluctuating Steps**, Phys. Rev. Lett. **89**, 136102.
14. C. Dasgupta and O. T. Valls (2003), **Two-step melting of the vortex solid in layered superconductors with random columnar pins**, Phys. Rev. Lett. **91** 127002 (cond-mat/0308084).
15. P. Chaudhuri, S. Karmakar, C. Dasgupta, H. R. Krishnamurthy, and A. K. Sood (2005), **Equilibrium glassy phase in a polydisperse hard sphere system**, Phys. Rev. Lett. **95**, 248301.
16. R. Viswanatha, P. K. Santra, C. Dasgupta, and D.D. Sarma (2007), **Growth mechanism of nanocrystals in solution: ZnO, a case study**, Phys. Rev. Lett. **98**, 255501.
17. P. Chaudhuri, S. Karmakar and C. Dasgupta (2008), **Signatures of dynamical heterogeneity in the density distribution at glassy free-energy minima**, Phys. Rev. Lett. **100**, 125701 (arXiv:0712.4398v1).
18. B. Mukherjee, P. K. Maiti, C. Dasgupta and A. K. Sood (2008), **Strongly anisotropic orientational relaxation of water molecules in narrow carbon nanotubes and nanorings**, ACS Nano **2**, 1189.
19. S. Karmakar, C. Dasgupta and S. Sastry (2009), **Growing length and time scales in glass forming liquids**, Proc. Natl. Acad. Sci (USA) **106**, 3675.
20. B. Mukherjee, P. K. Maiti, C. Dasgupta and A. K. Sood (2010), **Single-file diffusion of water inside narrow carbon nanorings**, ACS Nano **4**, 985.
21. S. Karmakar, C. Dasgupta and S. Sastry (2010), **Analysis of dynamic heterogeneity in a glass former from the spatial correlations of mobility**, Phys. Rev. Lett **105**, 015701.
22. S. Sengupta, S. Karmakar, C. Dasgupta and S. Sastry (2012), **Adam-Gibbs relation for glass-forming liquids in two, three, and four dimensions**, Phys. Rev. Lett. **109**, 095705.
23. S. Karmakar, C. Dasgupta and S. Sastry (2014), **Growing length scales and their relation to time scales in glass-forming liquids**, Annu. Rev. Condens. Matter Phys. **5**, 255.

24. S. Karmakar, C. Dasgupta and S. Sastry (2016), **Short-time  $\beta$ -relaxation in glass-forming liquids is cooperative in nature**, Phys. Rev. Lett. **116**, 085701.
25. S. Karmakar, C. Dasgupta and S. Sastry (2016), **Length scales in glass-forming liquids and related systems: a review**, Rep. Prog. Phys. **79**, 016601.
26. S. Chakrabarty, I. Tah, S. Karmakar, and C. Dasgupta (2017), **Block analysis for the calculation of dynamic and static length scales in glass-forming liquids**, Phys. Rev. Lett. **119**, 205502.
27. S. Chakraborty, H. Kumar, C. Dasgupta, and P. K. Maiti (2017), **Confined water: structure, dynamics, and thermodynamics**, Accounts of Chemical Research **50**, 2139-2146.
28. S.K. Nandi, R. Mandal, P.J. Bhuyan, C. Dasgupta, M. Rao, and N.S. Gov (2018), **A random first-order transition theory for an active glass**, Proceedings of the National Academy of Sciences USA **115**, 7688-7693.
29. I. Tah, S. Sengupta, S. Sastry, C. Dasgupta, and S. Karmakar (2018), **Glass Transition in supercooled liquids with medium-range crystalline order**, Phys. Rev. Lett. **121**, 085703.
30. R. Mandal, P. J. Bhuyan, P. Chaudhuri, C. Dasgupta and M Rao (2020), **Extreme active matter at high density**, Nature Communications **11**, 2581.

## Other Contribution to Physics

### Synergistic activities:

Convener, Centre for Condensed Matter Theory, Department of Physics, Indian Institute of Science (1998 - 2003).

Convener of Sectional Committee for Physics, Indian Academy of Sciences (2007-09).

Convener of Sectional Committee for Physics, Indian National Science Academy (2010-11).

Member of the Council of Management of Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore (2014-18).

Member of Project Advisory Committee on International Cooperation Programmes of Department of Science and Technology, Government of India (2016 - 2018).

Member of Project Advisory Committee on Physics-I (Condensed Matter Physics and Materials Sciences), Department of Science and Technology, Government of India (2018 - 2020). Member of Screening Committee for INSPIRE Faculty Awards in Physical Sciences (2016 - 2021).

Chairman of Screening Committee for INSPIRE Faculty Awards in Physical Sciences (2022 - present).

### Editorial Work:

Member of the Editorial Boards of *Scientific Reports*, Nature Publications (2015 - present), *EPJ-B: Condensed Matter and Complex Systems*, Springer (2012 - 2014), *Phase Transitions*, Taylor & Francis (2010 - present).

### Work as Referee:

Reviewer for *Physical Review Letters*, *Physical Review B*, *Physical Review E*, *Europhysics Letters*, *European Physics Journals*, *Journal Of Chemical Physics*, *Proceedings of National Academy of Sciences (USA)*, *Physica A*, *Journal of Statistical Physics*, *Journal of Statistical Mechanics (JSTAT)*, *Phase Transitions*, *Pramana*, *Indian Journal of Physics*.

**Selected as “Outstanding Referee” for Physical Review journals by the American Physical Society in 2008.**

**Selected as “Distinguished Referee” of the European Physical Journal in 2016.**

### Outreach Activities:

**Pedagogical Lectures at Schools/Workshops (since 2011) :**

- RRI School on Statistical Physics, Raman Research Institute, Bangalore, March 2011.
- DST-SERC School on Nonlinear Dynamics, IISER, Pune, 2011.
- IASc Lecture Workshop on Statistical Mechanics, Nehru Arts and Science College, Kanhangad, July 2011.
- Science Academies’ Refresher Course on Statistical Physics, Nehru Arts and Science College, Kanhangad, May 2012.
- Science Academies’ Refresher Course on Statistical Physics, Nehru Arts and Science College, Kanhangad, May 2013.

- Lecture Workshop for College Teachers, Indian Academy of Sciences, July 2015.
- Science Academies' Lecture Workshop on Topology in Condensed Matter Physics, Sri Dharmasthala Manjunatheswara College, Ujire, March 2017.
- C.K. Majumdar Memorial Summer Workshop in Physics, Kolkata, May 2018.
- National Summer School, S. N. Bose National Centre for Basis Sciences, Kolkata, June 2018.
- School on Entropy, Information and Order in Soft Matter, International Centre for Theoretical Sciences, Bangalore, September 2018.
- Science Academies' Refresher Course on Statistical Physics, Sir P. T. Sarvajanic College of Science, Surat, June 2019.

**Lectures for Undergraduate Students (since 2011):**

- Department of Physics, IIT Delhi, January 2012.
- Presidency University, Kolkata, December 2014.
- Department of Physics, Nagpur University, January 2016.
- Mount Carmel College, Bangalore, October 2016.
- Department of Physics, Delhi University, March 2017.
- The National College, Bangalore, July 2017.
- Mount Carmel College, Bangalore, October 2018.
- St. Stephens College, New Delhi (Popli Memorial Lectures), February 2021.