

Curriculum Vitae

(April 20, 2020)

Umesh Vasudeo Waghmare

Professor

Theoretical Sciences Unit

J Nehru Centre for Advanced Scientific Research (JNCASR)

Jakkur, Bangalore 560 064 INDIA

Phone: 91-80 2208 2842 [O], 91-94482-87711 [M], 91-80 2208 2766 [F]

Email: waghmare@jncasr.ac.in

Web: <http://www.jncasr.ac.in/waghmare>

Year of Birth: 1968

Citizenship: Indian

Place of Birth: Dhule, India

Residence: Indian

Field of Research: Theory, Modeling and Simulations of Condensed Matter and Materials

Education

PhD	Applied Physics	1996	Yale University, New Haven
MS, MPhil	Applied Physics	1994	Yale University, New Haven
BTech	Engineering Physics	1990 [Institute Silver Medal]	Indian Institute of Technology, Bombay

Work Experience

2009-present	Professor	Theoretical Sciences Unit, JNCASR, Bangalore
2017-present	Dean, Academic	JNCASR, Bangalore
2014-present	Adjunct Professor	Tata Institute of Fundamental Research, Mumbai
2010-2012	Adjunct Professor	Birck Nanotechnology Center, Purdue University
2005-2009	Associate Professor	Theoretical Sciences Unit, JNCASR, Bangalore
2000-2005	Assistant Professor	Theoretical Sciences Unit, JNCASR, Bangalore
1998-2000	Research Associate	Physics Department, Harvard University
1996-1998	Post-doctoral Fellow	Physics Department, Harvard University

Visiting/Other Positions

7/2010	Professor (visiting)	Inst of Materials Research, Tohoku University, Sendai, Japan
3/2008	Professor (visiting)	African University of Science and Technology, Abuja, Nigeria
9/2005	Associate Professor (visiting)	International Frontier Centre for Advanced Materials, Inst of Materials Research, Tohoku University, Sendai, Japan
5/2002	Visiting Scientist	Department of Physics and Astronomy, Rutgers University, USA

Awards

- GD Birla award for scientific research, KK Birla Foundation (2016)
- Distinguished Alumnus Award, Indian Inst of Technology, Bombay (2017).
- CNR Rao Prize Lecture, Materials Research Society of India (2016).
- Infosys Science Prize (Engineering and Computer Science), (2015).
- Fellow, Indian National Science Academy (2014).
- India Citation Award 2012, Thomson Reuters Research Excellence (2012).
- JC Bose National Fellowship, Govt of India (2012).
- Shanti Swarup Bhatnagar Prize in Physical Sciences, CSIR, India (2010).
- IBM Faculty Award (2009).
- DAE Outstanding Researcher Grant award, Govt of India (2009-2014).
- Fellow, Indian Academy of Sciences, Bangalore (2008).
- Fellow, National Academy of Sciences, Allahabad (2007).
- B. M. Birla Science Prize in Physics (2005).
- M.R.S.I (Materials Research Society of India) Medal in the year (2005).
- DuPont Young Faculty Grant award (2004).
- Associate, Indian Academy of Sciences, Bangalore (2001).

Research Publications Summary (see a complete list at the end)

Papers: 345

Chapters in books: 10

Co-editor (guest) of special issues of journals: 5

Co-editor of books: 1

Citation Analysis:

H-index of 56, with over **21000** citations [Ref. Web of Science; Author=Waghmare U*, April 2020].

H-index of 64, with over **27000** citations [Ref. Google Scholar, April 2020].

Citations *per year*: 2480 in the year 2019 [Ref. Web of Science],
3034 in the year 2019 [Ref. Google Scholar].

Other Professional Contributions

Associate Editor, Nanoscale, 2/2019-present.

Editor, Pramana – Journal of Physics, 1/2015 – present.

Secretary and Member, Council, Indian Academy of Sciences, Bangalore 1/2016-present.

Member, Council, National Academy of Sciences, Allahabad, 2019-present.

Member of the Research Council, Advanced Materials and Powder Research Institute (CSIR), Bhopal (2011-present).

Member, Nano Science Advisory Group, Nano Mission, Government of India (2012-present).

Member, Physical Sciences Committee, CSIR, Government of India (2015-present).

Co-Founder, Breathe Applied Sciences Pvt Ltd, a start-up company for CO₂ reduction (2016).

Nodal Coordinator, India-Africa program for cooperation in scientific research (2018-present).

Invited talks (Select ones from 2010 to present)

1. “Evolution of Functional Properties of Materials at Nano-scale: First-principles Theory”, TIFR-Infosys lecture, TIFR, Mumbai, January 22, 2018.
2. “2-D Materials for Applications in Energy and Environment”, Indo-Japan Conference on Applications of Layered Materials: Advances and Perspectives, Nagoya University, Nov 7, 2017.
3. “Computational Development of New Materials: an Integrated Approach based on Mechanics and Machine Learning”, Indian Association for Cultivation of Science, Kolkata, February 18, 2017.
4. “How Ideas from Basic Sciences led to Technologies”, Bangalore Science Forum, National College, April 25, 2016.
5. “Theoretical Predictions of Novel Structures, Phenomena and Functionality in 2-D Materials”, International Conference on Nano-science and Nano-Technology (ICONSAT), IISER-Pune, March 1, 2016..
6. “Theoretical Predictions of Novel Structures, Phenomena and Functionality in 2-D Materials”, CNR Rao prize lecture, Materials Research Society Annual Meeting, Jorhat, February 19. 2016.
7. “Smaller is Plastic: Multi-scale Hyperelasticity as a Mechanism of Deformation of Nano-scale hcp Metals”, Frontiers of Materials Science, IISc Bangalore, June 18, 2015.
8. “Behavior of Electrons in Materials: from Physics to Technologies”, Science Outreach Programme, Himalayan Gramin Vikas Samiti, Gangolihat, Uttarakhand, April 29, 2015.
9. “Emergence of Ferroelectricity at a Metal-Semiconductor Transition in MoS_2 ”, a plenary talk, 9th General Meeting of the Asian Consortium for Computational Materials Science”, Okinawa, Japan, December 22, 2014.
10. “Theory and Computer Simulations in Discovery of Materials”, 1st Commonwealth Science Conference, Bangalore, November 25, 2014.
11. “Exciting Physics of 2-D Materials”, Physics Colloquium, Indian Institute of Technology, Madras, September 10, 2014.
12. “First-principles Modeling and Simulations of Materials”, 6 lectures in the SERB School on Multi-scale Modeling and Simulations of Materials, University of Mumbai, December 9-12, 2013.
13. “Magnetoelectric Coupling in Elemental Se: An Effect of Electronic Topology”, TIFR Colloquium, November 6, 2013.
14. “Topological Defects in 2-D Materials”, Recent Progress in Graphene Research (RPGR-5 Conference), Tokyo Institute of Technology, September, 2013.
15. “Materials for Energy Storage, Conversion and Transport: First-principles Simulations”, Global AMES workshop, University of Cambridge, March 22, 2013.
16. “First-principles theory of ferroelectric transitions and domains”, Fundamental physics of ferroelectrics (FERRO 2013), Ames, Iowa, January 29, 2013.
17. “Topological Insulators and electronic topological transition”, JNCASR-Cambridge Winter school, Bangalore, December 7, 2012.
18. “First-principles theory of defects in graphene and related materials”, Indo-Korean meeting on advanced materials, POSTECH, Pohang, S Korea, October 27, 2012.
19. “Integrated Computational Materials Science and Engineering”, International Ceramic Congress, Chicago, July 18, 2012.
20. “First-principles Theory of Materials”, R A Masheklar Lecture, NCL, Pune, March 22, 2012.

21. "Theory of Defects in Graphene and Related 2-D Nano-materials", Meeting 60, Vedic Village, Kolkata, November 29, 2011.
22. "Theory of Defects in Graphene and Related 2-D Nano-materials", A colloquium, Indian Institute of Science, Education and Research, Pune, November 22, 2011.
23. "Nano-structured Materials for Thermoelectric Applications", Strongly Correlated Electron Systems (SCSE-2011), University of Cambridge, Cambridge, UK, September 2, 2011.
24. "Metal-semiconductor superlattices for thermoelectric applications", Indo-US-Israel conference at Northwestern University, Evanston, USA, March 23, 2011.
25. "Graphene, Stone-Wales Defects and BN-substitution: From Electrons and Phonons to its Deformation", a Plenary Talk in the Nano-Science and Nano-Technology (NSNT)-2011, February 26, 2011.
26. "Soft modes and dynamic crack instabilities", a conference on Pressure Effects in Materials, International Center for Materials Research, Univ of California, Santa Barbara, August 28, 2010.

Other Accomplishments and Contributions

- (i) Waghmare taught a course in computational materials science in the African University of Science Technology, and has published a paper with the students based on the course project on prediction of silicone (J of Physics Cond. Mat. (2010)).
- (ii) Waghmare has contributed several to several Outreach Programmes within India, such as Studens Mentoring Programme, Bangalore, and SOP in rural parts of Uttarakhand.
- (iii) Waghmare has been a technical consultant to
 - (a) General Electric, Bangalore,
 - (b) Tata Research, Design and Development Centre (TRDDC), Pune (paper based on their work received the SAIL-gold medal of the Indian Institute of Metals (2014)).
 - (c) Centre for Study of Science, Technology and Policy, Bangalore.
 - (d) Boeing, Bangalore.
 - (e) Shell, Bangalore.