

Jayashree Ramadas
Curriculum Vitae

Contact information

Homi Bhabha Centre for Science Education
Tata Institute of Fundamental Research
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Education

1974 B.Sc. in Physics, University of Poona
1976 M.Sc. in Physics, Indian Institute of Technology, Kanpur
1981 Ph.D. in Physics (Science Education), University of Poona
*Ph.D. work done at the Homi Bhabha Centre for Science Education (HBCSE),
Tata Institute of Fundamental Research (TIFR), Mumbai*

Award / Scholarships

1971-1981 National Science Talent Search Scholarship
1984-85 British Council's Technical Cooperation Training Programme
2011 TWAS Regional Office Prize for "Development of Scientific Educational Material"

Professional positions

Academic

August 2007 - present Professor (H)
February 2002 - July 2007 Associate Professor (G)
August 1997 - January 2002 Senior Research Scientist (E), later renamed to Research Scientist (F)
February 1991 - July 1997 Fellow (SE), later renamed to Reader (SE)
February 1984 - January 1991 Fellow (SD)
February 1983 - January 1984 Visiting Fellow
September 1976 - January 1983 Research Fellow

Administrative experience

November 2008 - June 2011 Dean, HBCSE Faculty

July 2011 - June 2016 Centre Director, HBCSE

Visiting positions

1984-1985 Visiting Scholar, Centre for Studies in Science and Maths Education, University of Leeds, UK

1985 (3 months) Visiting Scholar, Centre for Science and Maths Education, King's College London, UK

1987-1988 Research Associate, Center for Precollege Education, New Jersey Institute of Technology, Newark, NJ, USA

1988-1989 Visiting Scholar, Center for Science and Math Teaching, Tufts University, Medford, MA, USA

1989 (6 months) Visiting Scientist, Epistemology and Learning Group, Media Research Laboratory, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA

1998 (1 week) Visiting Scientist, Institute for Math and Science Education, University of Illinois at Chicago, Chicago, Ill., USA

Areas of work

- Cognitive studies of science learning (students' conceptions of light, motion, Galilean relativity, life, plants, students' epistemologies, diagrammatic representations, visuo-spatial reasoning)
- Evaluation of curriculum development programs; field work in rural, urban, formal and nonformal settings (1976-84); International initiatives in evaluation of inquiry-based science education (2005-10)
- Popular writing (*Economic Times*) (1993-94) and radio programs
- Curriculum development (Homi Bhabha Curriculum for Primary Science) (1995-2004)
<http://www.hbcse.tifr.res.in/smallscience>
- Research on visual and spatial modes in science learning (2007-)
<http://www.hbcse.tifr.res.in/vthinking>
- Teacher education (2011-)
<http://teacher-ed.hbcse.tifr.res.in/>

Teaching

Core and optional graduate courses related to cognition and science education

Website <http://www.hbcse.tifr.res.in/graduate-school/graduate-courses>

Volunteer teaching in a Mumbai slum (1977-79)

Ph.D. Thesis guide

S. Padalkar: **Spatial Cognition and Visualization in Elementary Astronomy Education**, TIFR, September 2010.

S. Mathai: **Visuals and Visualisation of Human Body Systems**, TIFR, September 2010.

Publications (Books and related)

Books

1. J. Ramadas, A. Kawalkar and S. Mathai: ***Small Science Teacher's Book for Class 1 and 2***, Homi Bhabha Centre for Science Education, Mumbai, 2004; InOpen Technologies, 2012.
 - Marathi translation by Deepali Palshikar: ***Halke Phulke Vidnyan, Iyatta 1 va 2 - Shikshak Pustak***, Homi Bhabha Centre for Science Education, Mumbai, 2010; InOpen Technologies, 2012.
2. J. Ramadas: ***Small Science Class 3 (TextBook)***, Homi Bhabha Centre for Science Education, Mumbai, 1998; Oxford University Press, 2007; InOpen Technologies, 2012.
3. J. Ramadas: ***Small Science Class 3 (WorkBook)***, Homi Bhabha Centre for Science Education, Mumbai, 1998; Oxford University Press, 2007; InOpen Technologies, 2012.
4. J. Ramadas: ***Small Science Class 3 (Teacher's Book)***, Homi Bhabha Centre for Science Education, Mumbai, 1998; Oxford University Press, 2007; InOpen Technologies, 2012.
5. Translations of 2, 3 and 4 above:
 - Hindi translations by K. K. Mishra: ***Halka Phulka Vigyan, Kaksha 3 - Pathya Pustika aur Karya Pustika***, Homi Bhabha Centre for Science Education, Mumbai, 1999; InOpen Technologies, 2012.

- Hindi translation by K. K. Mishra: ***Halka Phulka Vigyan, Kaksha 3 - Shikshak Pustika***, Homi Bhabha Centre for Science Education, Mumbai, 1999; InOpen Technologies, 2012.
 - Marathi translations by Shivali Tukdeo: ***Halke Phulke Vidnyan, Iyatta 3 - Pathya Pustak ani Kruti Pustak***, Homi Bhabha Centre for Science Education, Mumbai, 2000; InOpen Technologies, 2012.
 - Marathi translations by Shivali Tukdeo: ***Halke Phulke Vidnyan, Iyatta 3 - Shikshak Pustak***, Homi Bhabha Centre for Science Education, Mumbai, 2000; InOpen Technologies, 2012.
 - Urdu translation by Nihal Saghar (Ed. Noman Ghani): ***Halki Phulki Science, Darja Teen Amlī Kitab***, Centre for Promotion of Science, Aligarh Muslim University, Aligarh, 2008.
6. J. Ramadas: ***Small Science Class 4 (TextBook)***, Homi Bhabha Centre for Science Education, Mumbai, 2001; Oxford University Press, 2007; InOpen Technologies, 2012.
 7. J. Ramadas: ***Small Science Class 4 (Workbook)***, Homi Bhabha Centre for Science Education, Mumbai, 2001; Oxford University Press, 2007; InOpen Technologies, 2012.
 8. J. Ramadas: ***Small Science Class 4 (Teacher's Book)***, Homi Bhabha Centre for Science Education, Mumbai, 2001; Oxford University Press, 2007; InOpen Technologies, 2012.
 9. Translations of 6, 7 and 8 above:
 - Hindi translations by K. K. Mishra: ***Halka Phulka Vigyan, Kaksha 4 - Pathya Pustika aur Karya Pustika***, Homi Bhabha Centre for Science Education, Mumbai, 2002; InOpen Technologies, 2012.
 - Hindi translation by K. K. Mishra: ***Halka Phulka Vigyan, Kaksha 4 - Shikshak Pustika***, Homi Bhabha Centre for Science Education, Mumbai, 2006; InOpen Technologies, 2012.
 - Marathi translations by Deepali Palshikar: ***Halke Phulke Vidnyan, Iyatta 4 - Pathya Pustak ani Kruti Pustak***, Homi Bhabha Centre for Science Education, Mumbai, 2003; InOpen Technologies, 2012.
 - Marathi translation by Deepali Palshikar: ***Halke Phulke Vidnyan, Iyatta 4 - Shikshak Pustak***, Homi Bhabha Centre for Science Education, Mumbai, 2008; InOpen Technologies, 2012.
 - Urdu translations by Wadoodul Haque Siddiqui (Ed. S. M. A. Hashim Rizvi): ***Halki Phulki Science, Darja Chaar Darsi Kitab aur Amlī Kitab***, Centre for Promotion of Science, Aligarh Muslim University, Aligarh, 2008.

This series concludes with Small Science Class 5 TextBook, Workbook and Teacher's Book, authored by J. Vijapurkar, published by HBCSE, 2004 and 2006, Oxford University Press, 2007 and InOpen Technologies, 2012.

10. J. Ramadas (Ed.): *Proceedings of the International Workshop on the Cognitive Bases of Learning (December 7-12, 1995)*, Homi Bhabha Centre For Science Education, Mumbai, January 1997.
11. S. Chunawala, B. Mahajan, S. Mahurkar, C. Natarajan, J. Ramadas and K. Subramaniam: *The Roots of Reason: Science and Technology in the Ancient World*, Quest Publications, 2001.
12. J. Ramadas and S. Chunawala (Eds.): *epiSTEME-1 Research Trends in Science, Technology and Mathematics Education (epiSTEME Reviews Volume 1)*, Homi Bhabha Centre for Science Education, Mumbai, 2006.

Ph.D. Thesis

1. J. Ramadas: *Evolving and Testing a Strategy for Curriculum Development in Science Relevant to the Indian School System at the Primary and Secondary Levels*, Ph.D. Thesis, University of Poona, 1981.

Chapters in Books

1. J. Ramadas: Motion in children's Drawings, In I. Harel (Ed.), *Constructionist Learning*, MIT Press, Cambridge, MA, 1990.
2. J. Ramadas and M. Shayer: Schematic Representations in Optics, In P. Black and A. Lucas (Eds.), *Children's Informal Ideas: Towards Construction of Working Theories*, Routledge, London, 1993.
3. J. Ramadas: Science and Technology Education in South Asia, In E. Jenkins (Ed.), *Innovation in Science and Technology Education, Vol.8*, UNESCO, Paris, 2003.
4. J. Ramadas: Visual-spatial Modes in Science Learning, In B. Choksi and C. Natarajan (Eds.) *epiSTEME-2 Research Trends in Science, Technology and Mathematics Education (epiSTEME Reviews Volume 2)*, Mumbai: Macmillan India, 2008.
5. A. Srivastava and J. Ramadas: Analogy and Gesture for Mental Visualization of DNA Structure, In David Treagust and Chi-Yan Tsui (Eds.) *Multiple Representations in Biological Education*, pp.311-329, Springer series on "Models and Modelling in Science Education", Volume 5, Dordrecht, The Netherlands: Springer, 2013.

Book Review

1. J. Ramadas and S. Mathai: Book Review. Visualization in Science Education. Ed. John K. Gilbert (2005) Dodrecht: Springer. *International Journal of Science Education, 30* (15), 2091-6, 2008.

Publications (Research papers and reports)

Research Papers (In Journals)

1. J. Ramadas and V. G. Kulkarni: Pupil Participation and Curriculum Relevance, *Journal of Research in Science Teaching*, **19** (5), 357-365, 1982.
2. J. Ramadas: Use of Ray Diagrams in Optics, *School Science*, **XX**, 10-17, 1982.
3. J. Ramadas: Developing Independent Thinking through the Traditional Science Syllabus: An Approach and its Evaluation, *Indian Educational Review*, October 1986.
4. J. Ramadas, L. Novemsky and H. Kimmel: The Shape of Fish: A Marine Science Activity, *Science Activities*, Winter 1990.
5. J. Ramadas and R. Driver: Response to Martin Monk's Paper, 'Genetic Epistemological Notes on Recent Research into Children's Understanding of Light', *International Journal of Science Education*, **14** (1), 123-126, 1992.
6. S. Panse, J. Ramadas and A. Kumar: Alternative Conceptions in Galilean Relativity (I): Frames of Reference, *International Journal of Science Education*, **16** (1), 63-82, 1994.
7. J. Ramadas and U. R. Nair: The Systems Concept as a Tool in Understanding Ideas about the Digestive System, *International Journal of Science Education*, **18** (3), 355-68, 1996.
8. J. Ramadas, S. Barve and A. Kumar: Alternative Conceptions in Galilean Relativity (II): Distance, Time, Energy and Laws, *International Journal of Science Education*, **18** (4), 463-78, 1996.
9. J. Ramadas, S. Barve and A. Kumar: Alternative Conceptions in Galilean Relativity (III): Inertial and Non-inertial Frames, *International Journal of Science Education*, **18** (5), 611-26, 1996.
10. J. Ramadas: Prayogvidnyan, *Samvad nos. 7 & 8*, Homi Bhabha Centre For Science Education, Mumbai, 1996.
11. L. Kala and J. Ramadas: History and Philosophy of Science, Cognitive Science and Science Education: Issues at the Interface, *Indian Educational Review*, **37** (2), 2001.
12. S. Padalkar and J. Ramadas: Modeling the Round Earth through Diagrams, *Astronomy Education Review* **6** (2), 54-74, 2008.
<http://dx.doi.org/10.3847/AER2007018>

13. J. Ramadas: Introduction to the Special Issue on "Visual and Spatial Modes in Science Learning", *International Journal of Science Education*, **31** (3) Special Issue on "Visual and Spatial Modes in Science Learning", 297-299, 2009.
14. J. Ramadas: Visual and spatial modes in science learning, *International Journal of Science Education*, **31** (3) Special Issue on "Visual and Spatial Modes in Science Learning", 301-318, 2009. (Featured on the NSF funded searchable database "Relating Research to Practice" of the San Francisco Exploratorium.)
15. S. Mathai and J. Ramadas: Visuals and visualisation of human body systems, *International Journal of Science Education*, **31** (3) Special Issue on "Visual and Spatial Modes in Science Learning", 439-458, 2009.
16. S. Padalkar and J. Ramadas: Designed and spontaneous gestures in elementary astronomy education, *International Journal of Science Education*, **33**(12), 1703-1739, 2011.
17. K. Vinisha and J. Ramadas: Visual Representations of the water cycle in science textbooks, *Contemporary Education Dialogue*, **10**(1), 7-36, 2013.

Research Papers (In Conference/ Proceedings)

1. V. G. Kulkarni and J. N. Taskar (J. Ramadas): New Tools for the Evaluation of Science Education Programs, In R. G. Lagu (Ed.), *Proceedings of the Conference on Science Education, Khiroda*, Homi Bhabha Centre for Science Education, Bombay, 1978.
2. V. G. Kulkarni and J. N. Taskar (J. Ramadas): Evaluation of the Khiroda Project, In R. G. Lagu (Ed.), *Proceedings of the Conference on Science Education, Khiroda*, Homi Bhabha Centre for Science Education, Bombay, 1978.
3. V. G. Kulkarni, S. Ramani and J. N. Taskar (J. Ramadas): The High School in Maharashtra: Provisional Results from a Survey, In R. G. Lagu (Ed.), *Proceedings of the Conference on Science Education, Khiroda*, Homi Bhabha Centre for Science Education, Bombay, 1978.
4. J. Ramadas, L. Novemsky and H. Kimmel: The Jersey Coast Explorers: A Marine Science Program for Inner City Schools, *Proceedings of the Conference on Pre-College Education of Minorities in Science and Engineering*, Newark, NJ, May 1988, NJIT Press, 1989.
5. J. Ramadas: Curriculum, Constructivism and Spontaneous Conceptions in Science, *Paper presented at the 4th All India Peoples' Science Network Conference*, Homi Bhabha Centre for Science Education, Bombay, March 1990.
6. J. Ramadas: Cognitive Issues in Science Learning, *Proceedings of the Seminar on Language, Culture and Cognition*, New Delhi, March 1992.

7. J. Ramadas: Mathematics in Primary Science, *Paper presented at the Seminar on Aspects of Teaching and Learning Mathematics in the Primary School*, Centre for Science Education and Communication, New Delhi, Jan 1999.
8. S. Chunawala, C. Natarajan and J. Ramadas: Students' Ideas about Living and Non-living: An Indian Cross-cultural Study, *Proceedings of the 9th Symposium of the International Organization for Science and Technology Education (IOSTE) - Volume 1*, Durban, South Africa, 1999.
9. J. Ramadas and J. Vijapurkar: The Homi Bhabha Curriculum for Primary Science, *Proceedings of the International Conference on Science, Technology and Mathematics Education (ICSTME)*, Goa, India, Feb 2001.
10. S. Mathai and J. Ramadas: Putting Imagery Back into Learning: the Case of Drawings in Human Physiology. *Proceedings of the Conference epiSTEME-1*, Goa, India, 2004.
11. J. Ramadas: A New Curriculum for Primary Science, *Revive: a Publication of the 4th Annual Learning Network Conference*, Ahmedabad, Jan 2006.
12. S. Mathai and J. Ramadas: The Visual and Verbal as Modes to Express Understanding of the Human Body, D. Barker-Plummer (Eds.), *Diagrams 2006*, LNAI 4045, pp.173-5, Springer-Verlag Berlin, Heidelberg.
13. S. Padalkar and J. Ramadas: Indian Students' Understanding of Astronomy, *Proceedings of the Conference of Asian Science Education (CASE 2008)*, Kaohsiung, Taiwan, February 2008.
14. S. Padalkar and J. Ramadas: An Indigenous Approach to Elementary Astronomy - How Cognitive Research can Help, K. Subramaniam and A. Mazumdar (Eds.) *Proceedings of Conference epiSTEME-3*, Mumbai, India, 5-9 Jan 2009, pp. 69-75.
15. S. Padalkar and J. Ramadas: Using diagrams as an effective pedagogic tool in elementary astronomy. In Chunawala, S. and Kharatmal, M. (Eds.) *Proceedings of epiSTEME-4*, Mumbai, India, Jan 5-9, 2011, pp. 159-164.
16. P. Pande and J. Ramadas: Measurement experiences and responses to length comparison, seriation and proportioning tasks. In Nagarjuna, G., A. Jamakhandi and Ebie M. Sam (Eds.) *Proceedings of epiSTEME-5*, Mumbai, India, Jan 2013, pp. 145-151.

Technical Reports

1. V. G. Kulkarni, J. Ramadas, S. P. Ozarkar, N. R. Bondale and B. B. Deshmane: *Non-formal Science-Based Education, Technical Report No. 3*, Homi Bhabha Centre for Science Education, Bombay, 1984.
2. J. Ramadas and R. Driver: *Aspects of Secondary Students' Ideas about Light*, Centre for Studies in Science and Maths Education, University of Leeds, 1989.

3. J. Ramadas: *Children Talk About Motion*, Homi Bhabha Centre for Science Education, Bombay, December 1989.
4. V. G. Kulkarni, J. Ramadas, S. P. Ozarkar, N. R. Bondale and V. G. Gambir: *Science Based Non-formal Education*, Homi Bhabha Centre for Science Education, Bombay, March 1991.
5. J. Ramadas: *Lecture notes on Human Cognition*, Homi Bhabha Centre for Science Education, Bombay, 1992.
6. J. Ramadas: *Cognitive Studies at HBCSE, Technical Report No. 21*, Homi Bhabha Centre For Science Education, Bombay, 1993.
7. J. Ramadas and D. Ploger: *Understanding Mechanisms of Normal and Abnormal Digestion, Technical Report No. 28*, Homi Bhabha Centre for Science Education, Mumbai, 1996.
8. S. Chunawala, C. Natarajan, S. Apte and J. Ramadas: *Students' Ideas about Living and Non-living, Diagnosing Learning in Primary Science (DLIPS) Part-1, Technical Report No. 29*, Homi Bhabha Centre For Science Education, Mumbai, 1996.
9. C. Natarajan, S. Chunawala, S. Apte and J. Ramadas: *Students' Ideas about Plants, Diagnosing Learning in Primary Science (DLIPS) Part-2, Technical Report No. 30*, Homi Bhabha Centre For Science Education, Mumbai, 1996.
10. J. Ramadas, S. Chunawala, C. Natarajan and S. Apte: *Role of Experiments in School Science, Diagnosing Learning in Primary Science (DLIPS) Part-3, Technical Report No. 31*, Homi Bhabha Centre For Science Education, Mumbai-1996a
11. J. Ramadas et. al.: *Vidyarthyanच्या Vidnyanavishayi Utsfoorta Kalpana: Ek Samshodhan Ahwal (In Marathi) (Students' Spontaneous Conceptions in Science: A Research Report)*, Homi Bhabha Centre For Science Education, Mumbai-1996b.
12. K. Subramaniam and J. Ramadas: *Working Paper on In-service Teacher Professional Development for Elementary Education*, Submitted to MHRD, Homi Bhabha Centre for Science Education, November 2011.
<http://teacher-ed.hbcse.tifr.res.in/documentation>
13. K. Subramaniam, M. Kharatmal, M. Bhattacharya and J. Ramadas: *Interim Report to MHRD of DIET Visits, Working Group Meeting, Capacity Building Workshops, HBCSE*, Mumbai, India, October 2012, 12 pp.
<http://teacher-ed.hbcse.tifr.res.in/documentation>
14. J. Ramadas and members: *Joint Review Mission on Teacher Education*, Punjab, June 2013 (Report dated 14 October 2013, 112 pp.).
http://www.teindia.nic.in/Files/jrm/JRM_Reports/JRM_Report_Punjab-2013-14.pdf

15. J. Ramadas, Sugra Chunawala, V. D. Lale, Adithi Muralidhar and Vishakha Bansode: *Review of the new 3rd Standard EVS draft textbook prepared by Balbarati*, November 2013.

Guest Editorship

- *Vivek*, 8 (4), Quarterly on Artificial Intelligence, Special issue on “Cognitive Bases of Learning” National Centre for Software Technology, Mumbai, October 1995.
- *Vivek*, 9 (2), Quarterly on Artificial Intelligence, Special issue on “Cognitive Bases of Learning” National Centre for Software Technology, Mumbai, April 1996.
- J. Ramadas (2009): *International Journal of Science Education* Special Issue on “Visual and Spatial Modes in Science Learning”.

Publications (Popular articles)

Sixteen articles in the monthly column *First Principles* published on the *Sci-Tech* page of *The Economic Times*, 1993-94.

<http://www.hbcse.tifr.res.in/data/pdf/first-principles.pdf>

Web resources for teachers

Teacher resources for the *Small Science* curriculum were prepared under my mentorship. Many of these are developed by teachers and project staff at HBCSE.

coglab.hbcse.tifr.res.in/teacher-resources/

National and international committees

- 2011-16 *International Commission on Physics Education (ICPE, or IU-PAP Commission 14)*
- 2011-16 Chair (ex-officio), *National Steering Committee for Science and Astronomy Olympiads*
- 2013 Leader, *Joint Review Mission on Teacher Education in Punjab, Ministry of Human Resource Development*
- 2013-14 Chair, *Project Advisory Committee on Science Communication*, Department of Science and Technology

- 2012-13 *Committee to oversee and mentor programmes of the National Council for Science & Technology Communication (NCSTC)*, Department of Science and Technology
- 2013-14 - Member, *Governing Council, Vigyan Prasar*, Department of Science and Technology
- 2012 *Consultation group for the Justice J. S. Verma Commission on Teacher Education*
- 2012-13 *Central Advisory Board on Education (CABE) Committee for developing a framework and processes of the National Mission on Teachers and Teaching*
- 2011-13 *National Advisory Committee and National Scientific Committee for the Kishore Vaigyanik Protsahan Yojana (KVPY)*, DST
- 2011-13 *Expert Committee for the "Rajat Jayanti Vigyan Sancharak Fellowship" of Department of Science and Technology (NCSTC Division)*
- 2011-16 *Governing Council of the Atomic Energy Education Society (AEES)*.
- 2006-08 *International Oversight Committee* for the Evaluation of Inquiry-Based Science Education Programs
- 2005-2006 *Inter-Academy Panel (IAP) Working Group* on Evaluation of Inquiry-Based Science Education Programs
- 2004-05 *National Curriculum Framework: National Focus Group* on the Teaching of Science
- 1993-2003 International Contributing Editor for South Asia for *Science Education* (John Wiley)
- Science and arts curriculum committees of the *National Council of Educational Research and Training (NCERT)*
- Reviewer for the *International Journal of Science Education* (Taylor and Francis), *Contemporary Education Dialogue* (Sage)

Jayashree Ramadas
1 July, 2016