




# UNIVERSITY OF KOTA, KOTA

## Faculty Details Performa for UOK website

Title	Dr.	First Name	Namrata	Last Name	Sengar	Photograph
<b>Designation</b>	Assistant Professor					
<b>Address</b>	Department of Pure & Applied Physics University of Kota, Near Kabir Circle, Kota-324010 Rajasthan, India					
<b>Phone No. Office</b>	+91-744-2471038 (Telefax)					
<b>Mobile</b>	+91-94130-07690					
<b>E-mail</b>	namrata@uok.ac.in, namraghav@yahoo.co.in					
<b>Educational Qualifications</b>						
Degree	Institution				Year	
Ph.D.	University of Rajasthan, Jaipur.				2009	
Title: Utilisation of Solar Energy in Low Grade Energy Applications.						
M.Sc. (Physics)	Government College Ajmer, M.D. S. University, Ajmer.				1999	
<b>Career Profile</b>						
<ul style="list-style-type: none"> <li>Worked as Guest Faculty, Department of Pure and Applied Physics, University of Kota, Kota from October 2008 to April 2012.</li> <li>Worked as Lecturer (contract), Department of Pure and Applied Physics, University of Kota, Kota from October 2007 to May 2008.</li> <li>Worked as Guest Faculty, Department of Physics, University College of Engineering, Rajasthan Technical University, Kota from August 2006 to March 2007.</li> <li>Worked as Lecturer (temporary), Department of Physics, Modi Institute of Technology, Kota from October 2005 to February 2006.</li> <li>Worked at CSIR-SRF (Jan.2003- Dec.2004) and CSIR- JRF (Jan. 2001- Dec. 2002) at Department of Physics, University of Rajasthan, Jaipur.</li> </ul>						
<b>Area of Interest/ Specialization</b>						
Renewable and sustainable energy specifically solar thermal, solar buildings, photovoltaics, hybrid systems, energy efficiency and management, heat losses through the collectors, composite layers, development of technology for mini appliances, material development.						
<b>Subject Taught</b>						
<b><u>PG level</u></b>				<b><u>UG level</u></b>		
Solar Radiation and Energy Conversion				Solid State Physics		
Energy Efficient Buildings				Electronics		
Energy Audit and Management				Mechanics		
Electronics				Engineering Physics		
Energy Studies						

Non Linear Dynamics Condensed Matter Physics	
<b>Research Guided: M.Phil. (Physics)/M.Tech. (Renewable Energy/Solar Energy)</b>	
<ul style="list-style-type: none"> <li>• M.Phil Dissertation-Development and Study of Mathematical Model for Estimation of Cooking Time for Box Type Solar Cooker Submitted by Bhanu Jain at Department of Pure &amp; Applied Physics, University of Kota, Kota (2008).</li> <li>• M.Phil Dissertation-Study of Energy Consumption and Expenditure Pattern in Rural Areas of Rajasthan and Scope for Solar Energy Penetration Submitted by Ravi P. Vaishnav at Department of Pure &amp; Applied Physics, University of Kota, Kota (2008).</li> <li>• M.Phil Dissertation-A Review on the design aspects of the Solar Water Heating Systems Submitted by Nilofar Ansari at Department of Pure &amp; Applied Physics, University of Kota, Kota (2008).</li> <li>• M.Tech. Dissertation-Comparative theoretical and experimental studies of hot box solar cookers of three different shapes and different absorber surfaces, Submitted by Sachin Jain, Department of Renewable Energy, Rajasthan Technical University, Kota, Rajasthan, India (2015).</li> <li>• M.Tech. Dissertation-Study of Thermal Comfort and Energy Conservation possibilities in residential buildings of Rajasthan, Submitted by Pooja Soral, Department of Pure &amp; Applied Physics, University of Kota, Kota (2016).</li> <li>• M.Tech. Dissertation-Case Studies on Solar Photovoltaic and Concentrated Solar Power plants: A Comparative Study, Submitted by Arpita Jain, Department of Pure &amp; Applied Physics, University of Kota, Kota (2016).</li> <li>• M.Tech. Dissertation-Design, Development and Study of a Novel Hybrid Hatcher for Poultry Farming, Submitted by Krishan M. Kaushilk, Department of Pure &amp; Applied Physics, University of Kota, Kota (2016).</li> <li>• M.Tech. Dissertation-Evaluation of different building designs and materials to enhance thermal comfort, Submitted by Ankur Sharma, Department of Pure &amp; Applied Physics, University of Kota, Kota (2017).</li> <li>• M.Tech. Dissertation-Design Development and Experimental Study of Solar Air Cooler, Submitted by Saiful Islam, Department of Pure &amp; Applied Physics, University of Kota, Kota (2017).</li> <li>• M.Tech. Dissertation- Design Development and Study of Small Size Solar Water Heater for Dyers of Cottage Textile Industries, Submitted by Mohammad Usama, Department of Pure &amp; Applied Physics, University of Kota, Kota (2017).</li> <li>• M.Tech. Dissertation- Study, Design and Development of Thermal Storage in a Solar Dryer, Submitted by Pooja Gautam, Department of Pure &amp; Applied Physics, University of Kota, Kota (2017).</li> <li>• M.Tech. Dissertation-Design, Development and Study of Solar Induction Cooker, Submitted by Hitesh Jangid, Department of Pure &amp; Applied Physics, University of Kota, Kota (2017).</li> </ul>	
<b>Publication Profile</b>	
(a) Research Papers published in Refereed/Peer Reviews Journals:	
<ol style="list-style-type: none"> <li>1. P. Soral, A. Jain, N. Rathore, N. Sengar, Energy Conservation Opportunities and Improved Thermal Comfort in Residential Buildings: The Case-Study of Kota, Rajasthan, International Journal of Town Planning and Management Vol. 2: Issue 2, 2016, pp.21-27.</li> <li>2. N. Sengar, S. Mahavar, P. Dashora, Study of Energy Distribution on Absorber Tray of</li> </ol>	

- Cylindrical Hot-Box Solar Cooker for Global Solar Radiation, *Journal of Energy Research and Environmental Technology*, Vol. 3, Issue 3, 2016, pp. 201-206.
3. N. Sengar, M. Kaur and K. Singh, Projection of the Future Electricity Demands (2021-2041) for Rajasthan, India and a Sustainable Development Energy Model for Developing States, *International Journal of Recent Trends in Engineering and Science*, 2(8), 2016, 220-226.
  4. S. Mahavar, P. Rajawat, R.C. Punia, N. Sengar, P. Dashora, Evaluating the optimum load range for box-type solar cookers, *Renewable Energy*, 74, 2015, 187-194.
  5. N. Sengar, S. Jain, A Comparative Theoretical and Experimental Study of Hot Box Solar Cookers of Two Different Shapes and Same Aperture Areas, *International Journal of Science, Environment and Technology*, 4(3), 2015, 841-846.
  6. N. Sengar, P. Dashora, S. Mahavar, R. C. Punia, Mathematical Formalism to Study Energy Distribution Pattern in Solar Hot Boxes for Global Solar Radiation, *International Journal of Innovative Research in Science, Engineering and Technology*, 3(12), 2014, 18147-18156.
  7. N. Sengar and R. P. Vaishnav, Study of energy expenditure in rural households of Rajasthan, *Journal of Development Management*, 1 (3), 2013, 303-311.
  8. Mahavar S., N. Sengar, Verma, M., Rajawat P. and Dashora P., Novel Solar Cookers: Suitable for single families., *International Journal of Sustainable Energy*, 32 (6), 2013, 574-586.
  9. S. Mahavar S., N. Sengar, M. Verma, P. Rajawat and P. Dashora, Design development and performance studies of a novel Single Family Solar Cooker., *Renewable Energy*, 47, 2012, 67-76.
  10. V.K Marwal, R.C Punia, N. Sengar, S. Mahavar, and P. Dashora, A comparative study of correlation functions for estimation of monthly mean daily global solar radiation for Jaipur, Rajasthan (India), *Indian Journal of Science and Technology*, Vol. 5, No. 5, 2012, 2729-2732.
  11. R. C. Punia, V.K. Marwal, N. Sengar and P. Dashora, Numerical Modeling of a Box Type Solar Cooker, *International Journal of Advances in Science and Technology*, 4 (4), 2012, 75-83.
  12. N. Sengar, P. Dashora, M. Gupta and S. Mahavar, Experimental studies, energy savings and payback periods of a cylindrical building-material housing solar cooker, *International Journal of Energy, Information and Communications*, 2(3), 2011, 75-84.
  13. N. Sengar, P. Dashora and V. Marwal, On- Field Studies and Payback Periods of a Novel Building–Material–Housing Solar Water Heater, *International Journal of Advances in Science and Technology*, 2 (6), 2011, 94-99.
  14. S. Mahavar, N. Sengar, M. Verma and P. Dashora, Extensive experimental studies of a single family solar cooker, *International Journal of Energy, Information and Communications*, 2(4), 2011, 169-179.
  15. N. Sengar, P. Dashora and S. Mahavar, Low cost solar cooker: Promising solution towards reducing indoor air pollution from solid fuel use, *Indian Journal of Science and Technology*, 3, 2010, 1038-1042.

**(b) Other Publications in International/National Conferences/Symposium/Schools:**

1. A Study of Variation in Temperature Profile of Load with Change in Absorber Base Plate Materials for Hot Box Solar Cookers, *Proceedings of the National Conference on Advanced Functional Materials and Their Applications* Scientific Publishers, Organized by Department of Physics in association with Department of Mechanical Engineering, Govt. Women Engineering College, Ajmer. ISBN-978-81-7233-976-0. 2015, pp.109-112
2. On-Field Studies and Payback Periods of Novel Building-Material-Housing Solar

- Cooker. Published in Proc. of National Conference on Renewable Energy 2009, edited by A. D. Vyas, U. S. Mirdha and M. Vyas, organized by Vyas Institute of Engineering and Technology, Jodhpur, India, Nov. 5-7, 2009, pp.458-463.
3. Design Development and On-Field Studies of a Novel Nuclear Family Solar Cooker. Published in Proc. of National Conference on Renewable Energy 2009, edited by A. D. Vyas, U. S. Mirdha and M. Vyas, organized by Vyas Institute of Engineering and Technology, Jodhpur, India, Nov. 5-7, 2009, pp.464-469.
  4. Design, Development and Study of a Novel Solar Tea/Coffee Maker with Adjustable Surface Tilt. Presented at National Academy of Sciences 74<sup>th</sup> Annual Session, University of Rajasthan, Jaipur, December 2-4, 2004 and published in Proc. Nat. Acad. Sci. India, 77(A), III, 2007.
  5. A Novel Versatile Building Material Housing Solar Cooker: Boon for Developing Nations. Published in the peer- reviewed proc. of Solar World Congress 2005 edited by D. Y. Goswami, S. Vijayraghavan and R. Campbell-Howe organized by International Solar Energy Society (ISES), Orlando, Florida, USA, August 6-12, 2005, Paper No. 1327.
  6. Development and Study of a Novel Light-Weight Low-Cost Solar Cooker. Published in the peer- reviewed proc. of Solar World Congress 2005, edited by D. Y. Goswami, S. Vijayraghavan and R. Campbell-Howe, organized by International Solar Energy Society (ISES), Orlando, Florida, USA, August 6-12, 2005, Paper No. 1197.
  7. A promising way to solve problems related to health, economy, environment and energy crises: Use of solid waste material in solar thermal appliances'. Presented and Published in the Proc. of International Conference on Energy and Environment Technology for Sustainable Development (ICEET 2003), Ed. U. Pandel and M. P. Poonia Organised by Malviya National Institute of Technology, Jaipur, 8-10<sup>th</sup> October 2003, pg. 74.
  8. Development and performance analysis of highly economic, portable solar cookers. Presented and Published in the Proc. of International Conference on Energy and Environment Technology for Sustainable Development (ICEET 2003), Ed. U. Pandel and M. P. Poonia organised by Malviya National Institute of Technology, Jaipur, 8-10<sup>th</sup> October 2003, pg. 317.
  9. Thermal performance studies of a novel design building material solar collector. Presented and published in the Proc. of Twenty Sixth National Renewable Energy Convention of Solar Energy Society of India and International Conference on New Millennium – Alternative Energy Solutions for Sustainable Development, PSG Tech., Coimbatore on 17-19<sup>th</sup> January 2003, pg. 120.
  10. A novel design for low cost light weight solar collector with variable inclination glaze option. Presented and Published in the Proc. of International Conference on Recent Advances in Solar Energy Conversion Systems, Ed. R. M. Sarviya, R. K. Nema and J. L. Bhagoria, Maulana Azad Institute of Technology, Bhopal (M.P.) 28-29<sup>th</sup> September, 2002, pg. 161.

Book/book chapters

1. Partial Differential Equations: First order differential equation, separation of variables
2. Fourier Series
3. Integral Transforms
4. Fundamentals of Computers  
Above chapters in book-MPH02-Mathematical Physics and Numerical Analysis, VMOU, Kota.
5. Power Amplifiers
6. Field Effect Transistors

<p>Above chapters are in book MPH06-Applied Electronics</p> <p>7. Fourier Analysis of the Basis and Structure Factor</p> <p>Above chapter in book-MPH07-Solid State Physics, VMOU, Kota.</p>
<b>(c) Citations</b>
<p>Citations-92</p> <p>h-index- 6</p> <p>i10 index-3</p>
<b>Conference Organization/Presentations (in the last three years)</b>
<b>(a) Organization of a conference/School/Workshop etc.:</b>
<ul style="list-style-type: none"> <li>• Four day National Quantum Mechanics Workshop at University of Kota, Kota 27-30<sup>th</sup> January 2012.</li> <li>• Energy Meet -2012, November 22, organized by Department of Pure and Applied Physics, University of Kota, Kota.</li> <li>• National School on Quantum Mechanics, March 05-09, 2013, organized by Department of Pure and Applied Physics, University of Kota, Kota.</li> <li>• Energy Meet- December 2, 2013, organized by Department of Pure and Applied Physics, University of Kota, Kota.</li> <li>• National Seminar on Socio-Legal Issues and Challenges of Female Foeticide and Infanticide in India, October 4-5, 2013, organized by Women Cell, University of Kota, Kota.</li> <li>• National School on Quantum Mechanics, February 18-22, 2014, organized by Department of Pure and Applied Physics, University of Kota, Kota.</li> <li>• LEAD- 2014: National Workshop on Opportunities &amp; Challenges of Life, July 3-4, 2014, organized by Placement and Counseling Cell, University of Kota, Kota.</li> <li>• National Conference on Energy Technologies, Materials and Issues (Energy Meet-2014), organized by the Department of Pure and Applied Physics, University of Kota, Kota on Nov.14-15, 2014.</li> <li>• Seminar and Solar Products Exhibition (Energy Meet-2015), organized by the Department of Pure and Applied Physics, University of Kota, Kota on Dec. 11, 2015.</li> <li>• Workshop on Fundamentals of Solar Thermal Systems (Energy Meet-2016), organized by the Department of Pure and Applied Physics, University of Kota, Kota under Newton-Bhabha lesson sharing activity scheme on Dec. 5-6, 2016.</li> </ul>
<b>b) Participation as Paper/Poster Presenter/Invited talks:</b>
<ul style="list-style-type: none"> <li>• Best paper presentation award at Retopia-Technical fest on 11<sup>th</sup> Oct. 2012 organized by TERI University, New Delhi.</li> <li>• Delivered talk on Self-Insight and Counseling for Student Development, Dec. 21, 2014 organised by Placement and Counseling Cell, University of Kota, Kota.</li> <li>• Delivered lecture as an expert on 'Projects on Energy: Explore, Harness and Conserve' in a regional State DST program related to 20<sup>th</sup> National Children's Science Congress, Nov. 5, 2012.</li> <li>• Delivered lecture as an expert on 'Research Avenues in Field of Energy' in the P. G. Department of Physics at Agarwal P.G. College, Jaipur, Nov. 7, 2012.</li> <li>• Acted as resource person and delivered five invited lectures in 55<sup>th</sup> Refresher Course in Experimental Physics organized at University of Kota, Kota from Jan 9-25, 2014 sponsored by the three science academies of India.</li> <li>• Delivered lecture as an expert on Self Motivation for Entrepreneurs on Feb 2, 2014 during Entrepreneurship Development Program (Feb 19- April 2, 2014), organized by Department of Commerce and Management, University of Kota and Department of Science and Technology, Government of Rajasthan.</li> </ul>

- Delivered lecture as an expert during Short Term Course on Energy Audit for the faculties of Polytechnic College, Kota, March 3-7, 2014.
- Presented a paper “Power Scenario of India: Solar Energy Perspectives” at International Conference on Advances on Power Generation from Renewable Energy Sources on June 16, 2015 at Rajasthan Technical University, Kota.
- Delivered a lecture to train teachers for preparing students for Children Science Congress – 2015 at Regional DST centre, Kota on Oct. 12, 2015.
- Attended and presented paper “An Evaluation of Growth of Power Sector in Rajasthan: Pacing with Solar Energy” at National Seminar on “Critical Evaluation of Renewable Energy Sources-Potential, Techniques and Environmental Protection” organized by Maharishi Arvind College of Engineering and Technology, Kota on Feb. 26-27, 2016.
- Delivered lecture on “Fundamentals of Solar PV Technology” in Entrepreneurship Development Programme on April 11, 2016 at University of Kota, Kota.
- Delivered seminar at Durham Energy Institute on August 25, 2016 on topic “Power for all: Potentials and Challenges in India”, which was attended by faculty members and students of Durham University and University of Teeside, UK.
- Delivered an expert lecture at Regional Centre of Department of Science and Technology, Kota to the teachers about National Children Science Congress- 2016-17 with theme “Science, Technology and Innovation for Sustainable Development” on 5 October, 2016.
- Presented paper “A study to assess potential, deployment issues, challenges, awareness level and solution to promote solar cooking at household level in India” on 16 Jan. 2017 at 6<sup>th</sup> Solar Cooker International World Conference 2017 organized by Solar Cooker International Association at Goraj, Vadodara, Gujarat, India.
- Chaired session on Clean Energy on 14 February 2017 and attended GCRF Frontiers of Engineering for Development at Edinburg, Scotland, UK organized by Royal Academy of Engineering from 12-15 February, 2017.
- Delivered an invited talk on “Renewable Energy Technologies” at Career Point University, Alaniya, Kota on 28 February, 2017.
- Delivered a special lecture on Solar Energy on 12<sup>th</sup> April 2017 at Suryamitra Skill Development Program at Hadoti Pvt. ITI, Kota approved by National Institute of Solar Energy.
- Delivered invited talk on “Solar Energy Applications for Inclusive Growth in Developing Countries” at International Energy and Environment Workshop organized by Open University, UK on 25-26 May, 2017.

#### **Award/Distinctions/Projects**

- Shri Hari Kishan Das Karwa Smriti Puraskar for best student of Science faculty, 1997.
- Shri N.N.Bhatnagar Smriti Puraskar for highest marks in Physics in all three years of graduation, 1997.
- Shri Jyoti Swaroop Gupta Memorial Award for highest marks in graduation, 1997.
- Awarded Junior Research Fellowship by Council of Scientific and Industrial Research, New Delhi (CSIR- JRF) in 2001 at Department of Physics, University of Rajasthan, Jaipur.
- Upgraded from Junior Research Fellowship to Senior Research Fellowship in 2003.
- Won First prize for student project “Design and Study of Transmission Based Solar Energy Concentrator Collector” sanctioned by the State Department of Science and Technology, Jaipur for the year 2000-01 at State Level Student Project Seminar,



2003.

- **Best paper presentation award** at Retopia-Technical fest on 11<sup>th</sup> Oct. 2012 organized by TERI University, New Delhi.
- Member of Departmental Research Committee for Centre for Energy and Environment, Rajasthan Technical University, Kota (HVC nominee).
- **Lead Representative** from University of Kota in the Newton-Bhabha Higher Education Partnership Project between UK and India entitled “Enhancing teaching and research and development in Solar Energy Materials and Technologies through Capacity Building and Collaborative Research Projects” sponsored by Royal Academy of Engineering, UK in 2016.
- **Co-PI** in Royal academy of Engineering’s GCRF project- Internet of things- Smart Remote solar PV lab in collaboration with Open University, UK.
- **Co-PI** in Royal academy of Engineering’s GCRF project- Self-cleaning surface coatings for solar photovoltaic and thermal systems to minimise water wastage in cleaning in collaboration with University College of London, UK.
- **Partner** in Solar Oil Project in collaboration with Cranfield University, UK and Phycofeeds Ltd., UK.

#### **Association with Professional Bodies**

##### **(a) Memberships**

Solar Energy Society of India (SESI- Life Member)

Indian Association of Physics Teachers (IAPT- Life Member)

International Solar Energy Society (ISES)

#### **Other Activities**

- Acted as judge for evaluation of project reports at District level 20<sup>th</sup> National Children’s Science Congress organized by Department of Science and Technology at Regional Office, Kota on Nov. 30, 2012.
- Acted as judge for evaluation of project reports at State level 20<sup>th</sup> National Children’s Science Congress organized by Department of Science and Technology at Regional Office, Kota on Dec.4-6, 2012.
- Attended Fiftieth Refresher Course in Experimental Physics, August 6-22, 2013 organised by Indian Academy of Sciences, Bangalore.
- Participated in International Conference on Solar Energy: City of Kota-The next solar destination, Aug. 31-Sept 1, 2013, organized by Kota Municipal Corporation, Rajasthan.
- Participated in Workshop on Photovoltaic Devices: Molecule to Device, jointly organized by Department of Polymer Science, CSIR-National Chemical Laboratory and M/s Sinsil International, PhotoEmission Tech. Inc., Camarillo, USA at CSIR-National Chemical Laboratory, June 9-10, 2014, Pune.
- One Week Short Term Training Program on Advanced Computational Mechanics from July 14-18, 2014 at Defence Institute of Advanced Technology – Pune.
- Attended Orientation Course from May 18-June 13, 2015 at UGC-HRDC University of Rajasthan, Jaipur.
- Participated in Young Scientists Meet, India International Science Festival organized by Ministry of Science and Technology and Vijnana Bharati at IIT Delhi from Dec. 5-7, 2015.
- Attended UGC-HRDC Refresher Course on Computer Applications (Inter-Disciplinary) from May 11, 2016 to May 31, 2016 at University of Kota.
- Undertook visit to partner UK universities-Cranfield University and Durham

University for Newton-Bhabha HEP project work from June 3 to August 30, 2016.

- Attended annual Prestige Lecture on “Precision Mechanics and Mechatronics in ASML Lithography equipment- Key drivers for the continuation of Moore’s law for semiconductor devices” delivered by Dr. Ir. Jelm Franse, Senoir Director Precision Mechanics at ASML, Netherlands organized by EPSRC Centre in Ultra Precision, Cranfield University, UK on June 28, 2016.
- Attended one day training programme on Sexual Harassment of Women at Workplace Act 2013 on November 7, 2016 at Suchana Kendra, Kota.
- Acted as Judge at District level National Children Science Congress 2016-17 at Regional Centre of Department of Science and Technology, Kota on November 25, 2016.
- Attended short term training UGC-HRDC, MDSU, Ajmer sponsored one week short-term course entitled "Separation Techniques and Instrumental Methods of Analysis" from 30 Jan-4 Feb, 2017.
- Member, Placement and Counseling Cell, University of Kota, Kota, 2012 till now.
- Member, Women Cell, University of Kota, Kota, 2012.
- Member, Anti-Ragging Committee, University of Kota, Kota, 2014.
- Member, Placement and Counseling Cell, University of Kota, Kota, 2014.
- Member Secretary, NAAC Conducting Committee, University of Kota, Kota, 2014.
- Member, Anti-Ragging Squad, University of Kota, Kota, 2016.
- Member, Hindi cell, University of Kota, Kota, 2015.
- Member in various committees for smooth conduction of various activities in University such as Student Union Election, Convocation, Prize Distribution, 12(b) team visit etc.