

## **Dr. NANDKUMAR TUKARAM MANDLIK**

### **Personal Details:-**

<b>Name</b>	<b>MANDLIK</b>	<b>NANDKUMAR</b>	<b>TUKARAM</b>
	<i>SURNAME</i>	<i>FIRST NAME</i>	<i>MIDDLE NAME</i>
<b>Department</b>	<b>PHYSICS</b>		
<b>Designation</b>	<b>Asst. Professor</b>		
<b>Qualification(s)</b>	<b>M. Sc. (Physics), SET, Ph.D.</b>		
<b>Certification(s)/Professional Courses/Exams</b>	<b>SET, MS-CIT</b>		
<b>Email-Id</b>	<b>ntmandlik@fergusson.edu</b>		
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### **Member Of:-**

<b>College Committees</b>	<b>Other Committees</b>
Research Coordination Committee, IQAC	Life Member, Luminescence Society of India
B.Sc. and M.Sc. Admission Committee	Life Member, Indian Association of Physics Teachers

### **Research Done:**

<p>Synthesized different micro and nanophosphors such <math>\text{Al}_2\text{O}_3:\text{C}</math>, <math>\text{Al}_2\text{O}_3:\text{Eu}</math>, <math>\text{Al}_2\text{O}_3:\text{Graphene}</math> composite, <math>\text{CaSO}_4:\text{Dy}</math>, <math>\text{CaSO}_4:\text{Eu}</math>, <math>\text{K}_2\text{Ca}_2(\text{SO}_4)_3:\text{Eu}</math>, <math>\text{K}_2\text{Ca}_2(\text{SO}_4)_3:\text{Cu}</math>, by different methods such as Thermal Plasma Reactor, Chemical Co-precipitation Method, Acid Recrystallization method and Solid-State Diffusion/Melting Method.</p>
<p>These micro and nanophosphors were characterized by different techniques such XRD, SEM, TEM, UV-Visible, TG-DTA. Also, their Thermoluminescence, Optically Stimulated Luminescence and Photoluminescence properties were studied.</p>

### **Area of Interest in Research:**

Radiation Dosimetry/Radiation Physics
Material Science
Thermoluminescence, Photoluminescence and Optically Stimulated Luminescence

## Books Published:

Name of Book	Author(s)	ISBN No.	Year	Edition	Publisher
Oscillations, Waves & Sound and Optics	<b>Dr. Nandkumar Mandlik</b> , Dr. Anil Garje, Prof. Mahendra Waghmare	978-93-5158-122-2	2014	1 <sup>st</sup> edition	Success Publications Pune
Mathematical Methods in Physics & Electronics	Dr. Vasant G. Wagh, <b>Dr. Nandkumar Mandlik</b> , Dr. Sopan M. Rathod	978-93-84916-32-9	2015	1 <sup>st</sup> edition	Success Publications Pune

## Research publications:

<p>1. <i>Thermoluminescence study of <math>K_2Ca_2(SO_4)_3</math>:Cu nanophosphor for gamma ray dosimetry.</i> <b>Nandkumar Mandlik</b>, B. J. Patil, P. D. Sahare, V. N. Bhoraskar, S. D. Dhole, Nuclear Instruments and Methods in Physics Research B 315 (2013) 273–277.</p>
<p>2. <i>Study of Optically Stimulated Luminescence of <math>K_2Ca_2(SO_4)_3</math>:Cu nanophosphor for gamma ray dosimetry.</i> <b>Nandkumar Mandlik</b>, P. D. Sahare, M. S. Kulkarni, B. C. Bhatt, V. N. Bhoraskar, S. D. Dhole, Journal of Luminescence 146 (2014)128–132.</p>
<p>3. <i>Thermoluminescence and Photoluminescence properties of <math>K_2Ca_2(SO_4)_3</math>: Cu nanophosphor for gamma radiation dosimetry.</i> <b>Nandkumar Mandlik</b>, J. S. Bakare P. D. Sahare, V. N. Bhoraskar, S. D. Dhole, Indian Journal of Pure and Applied Physics, Vol.50 (2012) 859-862.</p>
<p>4. <i>Thermoluminescence and Photoluminescence study of <math>CaSO_4</math>:Dy nanophosphor for 6MeV energy electron dosimetry.</i> <b>Nandkumar Mandlik</b>, V. N. Bhoraskar S. D. Dhole, et. al. Radiation Protection and Environment, Vol.34 (2012) 185-189.</p>
<p>5. <i>Thermoluminescence of nanocrystalline <math>CaSO_4</math>: Dy for gamma dosimetry and Calculation of Trapping Parameters using Deconvolution Method.</i> <b>Nandkumar Mandlik</b>, B. J. Patil, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole, Solid State Physics AIP Conference Proceeding, 1591, 369-371 (2014).</p>
<p>6. <i>Study of Thermoluminescence and Photoluminescence Properties of <math>K_2Ca_2(SO_4)_3</math> : Eu Phosphor by electron irradiation.</i> <b>N. T. Mandlik</b>, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole, Proceedings of International Conference on Luminescence and its Applications (ICLA-2012), 7-10 February, 2012, Hyderabad, India.</p>
<p>7. <i>Thermoluminescence Response of <math>K_2Ca_2(SO_4)_3</math> Nanophosphor Co-doped with Eu and Ce for Gamma Ray Dosimetry.</i> B. J. Patil, Mahesh. Bhadane, N. T. Mandlik, S. S. Dahiwal, M. S. Kulkarni, B. C. Bhatt, V. N. Bhoraskar and S. D. Dhole, Solid State Physics AIP Conference Proceeding, 1665, 050109-1–050109-3 (2015).</p>

## Papers Presented in Conference and Workshops:-

<p>1. <i>CaSO<sub>4</sub>:Dy nanoparticles for 6MeV electron Dosimetry.</i>  <b>N. T. Mandlik</b>, J. S. Bakare, P. D. Sahare, S. S. Dahiwale, S. D. Dhole, V. N. Bhoraskar.          Indo-Russian Workshop on Nanotechnology and Laser Induced Plasma-2009 (IRNANO-2009), 24-26 November 2009, University of Delhi, Delhi, India.</p>
<p>2. <i>Thermoluminescence of K<sub>2</sub>Ca<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>:Cu<sup>2+</sup> Nanoparticles.</i>  <b>N. T. Mandlik</b>, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole.          National Seminar on Nano materials for Devices: Characterization and Applications (NS 2010), 24-26 June 2010, Department of Physics, University of Pune, Pune, India.</p>
<p>3. <i>Thermoluminescence of K<sub>2</sub>Ca<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>:Cu<sup>2+</sup> Nanoparticles for high energy electron dosimetry.</i>  <b>N. T. Mandlik</b>, J. S. Bakare, P. D. Sahare, V. N. Bhoraskar, S. D. Dhole.          National Conference on Luminescence and its Applications NCLA-2011, 7-9 February 2011, Raipur, Chhattisgarh, India.</p>
<p>4. <i>Thermoluminescence and Photoluminescence properties of K<sub>2</sub>Ca<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>:Cu nanophosphor for gamma radiation dosimetry.</i>  <b>N. T. Mandlik</b>, J. S. Bakare, P. D. Sahare, V. N. Bhoraskar, S. D. Dhole.          Conference on Accelerator Radiation Safety (CARS 2011), 16-18 November 2011, Bhabha Atomic Research Centre (BARC), Mumbai, India.</p>
<p>5. <i>Synthesis of K<sub>2</sub>Ca<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>:Eu nanorods for 6.5MeV electron dosimetry.</i>  <b>N. T. Mandlik</b>, S. D. Dhole, P. D. Sahare, V. N. Bhoraskar.          International Conference on Nanomaterials and Nanotechnology (ICNANO-2011), 18-21 December 2011, University of Delhi, Delhi, India.</p>
<p>6. <i>Irradiation effects of 6.5 MeV electrons on the CaSO<sub>4</sub>:xEu<sup>2+</sup> nanophosphor and application to dosimetry.</i>          S. D. Dhole, <b>N. T. Mandlik</b>, P. D. Sahare, V. N. Bhoraskar.          International Conference on Nanomaterials and Nanotechnology (ICNANO 2011), 18-21 December 2011, University of Delhi, Delhi, India.</p>
<p>7. <i>Study of Thermoluminescence and Photoluminescence Properties of K<sub>2</sub>Ca<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>: Eu Phosphor by electron irradiation.</i>  <b>N. T. Mandlik</b>, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole.          International Conference on Luminescence and its Applications (ICLA-2012), 7-10 February 2012, Hyderabad, India.</p>
<p>8. <i>Thermoluminescence study of CaSO<sub>4</sub>:Dy nanophosphors for 6MeV energy electron dosimetry.</i>  <b>N. T. Mandlik</b>, V. N. Bhoraskar, P. D. Sahare, M. S. Kulkarni, S. D. Dhole.          30<sup>th</sup> IARP Conference, National Conference on Radiological Protection and Safety in Nuclear Reactors and Radiation Installations (IARPNC-2012), 15-17 March 2012, Mangalore University, Mangalore, Karnataka, India.</p>
<p>9. <i>Photoluminescence and Thermoluminescence Study of K<sub>2</sub>Ca<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>: Cu Nanophosphor for Gamma Ray.</i>  <b>Nandkumar Mandlik</b>, B. J. Patil, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole.          The 25<sup>th</sup> International Conference on Atomic Collisions in Solids (ICACS-25), 21-27 October 2012, Kyoto University, Japan.</p>
<p>10. <i>Luminescence Properties of K<sub>2</sub>Ca<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>:Eu micro and nanophosphor for electron dosimetry.</i>  <b>Nandkumar Mandlik</b>, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole.          National Conference on Luminescence and its Applications (NCLA-2013), 8-10 January 2013, Bangalore, India.</p>

<p>11. <i>Synthesis and Thermoluminescence Properties of <math>K_2Ca_2(SO_4)_3:Eu</math> nanophosphor for high dose gamma ray dosimetry.</i>  <b>Nandkumar Mandlik</b>, B. J. Patil, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole.  National Conference on Functional Nanomaterials, 31 Jan. - 02 Feb. 2013, Department of Physics, University of Pune, India.</p>
<p>12. <i>Thermoluminescence of nanocrystalline <math>CaSO_4:Dy</math> and Calculation of Trapping Parameters using Deconvolution Method.</i>  <b>Nandkumar Mandlik</b>, B. J. Patil, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole.  Raman Memorial Conference -2013 during 22-23 February 2013, Department of Physics, University of Pune.</p>
<p>13. <i>Effect of micro to nano size variation on Thermoluminescence characteristics of <math>CaSO_4:Eu</math> phosphor for dosimetry applications.</i>  <b>Nandkumar Mandlik</b>, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole.  International Workshop on Nanotechnology and Advanced Functional Materials (NTAFM 2013), 24-25 July 2013, National Chemical Laboratory, Pune, India.</p>
<p>14. <i>Thermoluminescence of nanocrystalline <math>CaSO_4:Dy</math> for gamma dosimetry and Calculation of Trapping Parameters using Deconvolution Method.</i>  <b>Nandkumar Mandlik</b>, V. N. Bhoraskar, P. D. Sahare, S. D. Dhole.  58<sup>th</sup> DAE Solid State Symposium (DAE-SSPS-2013), December 17-21, 2013, Thaper University, Patiala.</p>
<p>15. <i>Synthesis of nanocrystalline <math>Al_2O_3:C</math> by Thermal Plasma Reactor for Dosimetric Purposes.</i>  <b>Nandkumar Mandlik</b>, Vijay Varma, Suyog Raut, P. D. Sahare, V. N. Bhoraskar, S. D. Dhole, V. L. Mathe, S. V. Bhoraskar  National Symposium on Emerging Plasma Techniques for Materials Processing and Industrial Applications (N-SEPMI-2014), February 13-15, 2014, Department of Physics, University of Pune.</p>
<p>16. <i>Study of dosimetric characteristics of nanocrystalline <math>Al_2O_3:C</math> Synthesized by Thermal Plasma Reactor.</i>  <b>Nandkumar Mandlik</b>, Vijay Varma, M. S. Kulkarni, B. C. Bhatt, K. P. Muthe, V. N. Bhoraskar, P. D. Sahare, V. L. Mathe, S. V. Bhoraskar, S. D. Dhole  National Conference on Advances in Radiation Measurement Systems and Techniques (IARPNC – 2014) - March 19 – 21, 2014, BARC Mumbai.</p>
<p>17. <i>Thermoluminescence characteristic and Phase Transition of <math>K_2Ca_2(SO_4)_3:Eu</math> nanophosphor at different annealing temperatures.</i>  <b>Nandkumar Mandlik</b>, P. D. Sahare, S. S. Dahiwal, B. J. Patil, M. S. Bhadane, V. N. Bhoraskar, S. D. Dhole  National Conference on Advances in Radiation Measurement Systems and Techniques (IARPNC – 2014) - March 19 – 21, 2014, BARC Mumbai.</p>
<p>18. <i>Development of nanophosphors and study of Thermoluminescence, Photoluminescence and Optically Stimulated Luminescence for gamma and electron dosimetry.</i>  <b>Nandkumar Mandlik</b>, P. D. Sahare, S. V. Bhoraskar, S. D. Dhole  Innovation 2015, Regional Research Conference - 23 June 2015, Fergusson College Pune.</p>
<p>19. <i>Study of Thermoluminescence(TL) and Optically Stimulated Luminescence (OSL) of <math>CaSO_4:Eu</math> Nanophosphor.</i>  <b>Nandkumar Mandlik</b>, M. S. Kulkarni, Munish Kumar, P. D. Sahare  Innovation 2015, Regional Research Conference - 23 June 2015, Fergusson College Pune.</p>

## Seminars and Workshops Attended:-

1. Workshop on T.Y.B.Sc. (Physics) Syllabus revision for core courses, Department of Physics, Fergusson College,Pune, Jan -17, 2004
2. Workshop for Teachers: T.Y.B.Sc. (Physics) Department of Physics, Pune University, Feb-20-21, 2004
3. Workshop on Revision of T.Y.B.Sc.Physics Practical Courses, Nowrosjee Wadia College, Pune, Feb-29 , 2004
4. Seminar in Physics “Remembering Einstein”, B.R.Gholap, College, Sangavi, Pune, Jan-21, 2006
5. Workshop on “M.Sc. Physics –I Syllabus Revision”, Fergusson College Pune, Dec.-10, 2007
6. National Conference on “Renewable Energy for Youth Empowerment in Rural Area”, S.N.Arts, D.J.Malpani Commerce & B.N.Sarda College, Sangamner, 23-25 March 2008
7. Workshop on Revised Syllabus of F.Y.B.Sc. Biotechnology (2008-2009), Department of Biotechnology, Fergusson College ,Pune, Oct 4, 2008
8. Workshop on “Framing of S.Y.B.Sc.( Physics) Syllabus”, Anantrao Thopate College Bhor, Dec-10, 2008
9. Workshop on “M.Sc Physics- II Syllabus Revision”, Department of Physics, Fergusson College, Pune, 27 <sup>th</sup> Dec 2008
10. Workshop on “Energy Generation & Conservation”, B.R.Gholap, College, Sangavi, Pune, Jan-10, 2009
11. Two Days State level seminar on 'Frontiers in Astronomy' in collaboration with IUCAA, Fergusson College, Pune, 5-6 Feb 2009
12. Raman Memorial Conference 2009, Department of Physics, Pune University, 26-27 Feb, 2009
13. International Workshop on Nanotechnology and Advanced Functional Materials National Chemical Laboratory Pune, July 9-11, 2009
14. Workshop on “Revised Syllabus of F.Y.B.Sc. Biotechnology (2008-2009), Fergusson College, Pune, Oct - 4, 2009
15. Indo-Russian Workshop on Nanotechnology and Laser Induced Plasma-2009, University of Delhi, Nov 24-26, 2009
16. Workshop for Finalization of Syllabi for T.Y.B.Sc. Physics Courses of Pune University, Department of Physics, H.V.Desai, College, Pune, Dec 30, 2009
17. Workshop on Revision of T.Y.B.Sc. Physics Syllabus, Department of Physics, Nowrosjee Wadia College, Pune, Jan 12-13, 2010
18. Workshop on “Energy Generation & Conservation”, Annasaheb Magar Mahavidyalaya, Hadapsar, Pune, Feb 2, 2010
19. International Symposium on “Renewable Energy for Rural, Development” (ISORE-2010), S.N. Arts, D.J. Malpani Commerce & B.N.Sarda College, Sangamner, Ahmednagar, Feb 25-27, 2010
20. Mentoring Skills (Training Workshop), Department of Psychology, Fergusson College Pune, Oct 15, 2010
21. State Level Seminar on Innovative Research Projects for Teachers and Students, H.V. Desai College, Pune, Feb 2-5, 2012
22. Raman Memorial Conference -2012, Department of Physics, University of Pune, March 2-3, 2012
23. Workshop on International Physics Teacher with DST Program Advisory Committee (PAC) Members, Department of Physics, University of Pune, Sept 15, 2012
24. State Level Conference on Autonomy to Colleges & role of IQAC, Fergusson College Pune, Sept 10-11, 2013
25. Vedic Science and Technology Day, Fergusson College Pune, Jan 11-12, 2014

26. Frontiers in Physics-VII Astronomy Frontiers, Department of Physics, Fergusson, College Pune, Jan 21-23, 2014
27. Raman Memorial Conference- 2104, Department of Physics, University of Pune, Feb 7-8, 2014
28. Workshop on 'Revision of Syllabus of Second Year M.Sc. Physics', H.V. Desai College, Pune, March 3, 2014
29. Workshop on 'Revision of S.Y.B.Sc. Physics Syllabus', Nowrosjee Wadia College, Pune, March 25, 2014
30. National Conference on Advances in Electronics & its Interdisciplinary Applications (NCAEIA-2014), Fergusson College Pune, Sept 19-20, 2014
31. Theme meeting on OSL as a tool for Radiation Dosimetry: Recent Developments in India OSL-TRD 2014, BARC Mumbai, Nov 13-14, 2014
32. Restructuring of T.Y.B.Sc. Physics Syllabus (Theory), B.R.Gholap College, Pune, Jan 28, 2015

### **Seminars and Workshops Organized:-**

Member of Organization Committee of Innovation 2015, Regional Research Conference, 23 June 2015 at Fergusson College Pune.
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### **Other Accomplishments:-**

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| 1. Award of "Department of Science and Technology, India travel grant" to attend 25 <sup>th</sup> International Conference on Atomic Collisions in Solids (ICACS-25), and 8 <sup>th</sup> International Symposium on Swift Heavy Ions in Matter (SHIM-2012) held at Kyoto, Japan during 21 <sup>st</sup> Oct to 27 <sup>th</sup> Oct 2012. |
| 2. Best Paper Award ( 1 <sup>st</sup> Prize) in National Symposium on Emerging Plasma Techniques for Materials Processing and Industrial Applications (N-SEPMI-2014), February 13-15, 2014, Department of Physics, University of Pune.   |