Name : Dr. Kiran P. Adhi

Qualification : M.Sc. (Physics) Ph.D. (Physics)

Designation : Reader in Physics

Specialization : Laser, Pulsed laser deposition of thin films viz. Wide band gap semiconductors, Colossal Magneto resistant materials etc., Optical emission spectroscopy.

Email : kpa at physics.unipune.ernet.in

Phone : 020 – 2569 2678 ext 300

1. Education:

S.No	Course	Institution	Year	Details
1	Ph.D	University of Pune	1991	Lasers
2	M.Sc.	University of Pune	1984	-
3.	B.Sc.	Osmania University	1982	Distinction

2. Career Profile

S. No.	Organization/Institution	Designation	duration
1.	University of Pune	Reader	Since March 2008
2.	University of Pune	Lecturer	Aug. 1991 – March 2008
3.	University of Arkansas	Visiting Research Assistant Professor	Oct. 1999 – Sept. 2000

3. Teaching Experience :

Experience of over 17 years

Courses taught:

(M.Sc.) Laser I, Laser II, Laser practicals (III and IV semester of M.Sc), Mathematical Methods for Physics (Tutorials), Statistical Mechanics (Tutorials), Electro – Dynamics II (Tutorials), Basic Physics Laboratory I and II

(M. Phil) Problem solving, Lasers.

4. Research Interest / Specialization:

Laser, Laser material interaction, Pulsed laser deposition of wide band gap semiconductors, CMR materials, etc. Optical emission spectroscopy of laser produced plasma, devices. Swift heavy ion beam irradiation of thin films.

5. Honors / Awards : NIL.

6. Publications: Books – Nil., Journals – 28, Articles - Nil

Journals: **List of Publications**

A. International Journals

I.Pulsed laser deposition and optical emission spectroscopy :

1. Direct observation / characterization of spatial distribution of current leakage spots in ZnO / AlN thin film precursor field effect transistors (FET) structures using conducting atomic force microscopy
   Shrishendu Dey, Suhas M. Jejurikar, **K. P. Adhi** and C. V. Dharmadhikari
   Appl. Phys. Lett., 93, 093510 (2008)
2. Impact of aluminum nitride as an insulator on the performance of zinc oxide thin film transistors
   M. M. De Souza, S. Jejurikar and K. P. Adhi
   Appl. Phys. Lett. 92, 093509 (2008)
3. Field emission studies of nano structured c-axis oriented GaN film on SiOx/Si(100) by pulsed laser deposition
   Suhas M. Jejurikar, P. M. Koinkar, M. A. More, D. S. Joag, **K. P. Adhi,** L. M. Kukreja
   Solid State Communication 144, 296 (2007)
4. Effect of swift heavy ion irradiation on the surface morphology of highly c-axis oriented LSMO thin films grown by pulsed laser deposition
   M. S. Sahasrabudhe, D. N. Bankar, A. G. Banpurkar, S. I. Patil, **K. P. Adhi**, Ravi Kumar
   Nucl. Instr. and Methods in Phys. Res. (NIM B) 263 (2007) 407–413

5. Growth Temperature and N_2 Ambient Pressure Dependent Crystalline Orientations and Band-gaps of Pulsed Laser Deposited AlN / (0001) Sapphire Thin Films
   Suhas M. Jejurikar, A. G. Banpurkar, Deepak N. Bankar, **K. P. Adhi**, L. M. Kukreja, V. G. Sathe
   J. crystal growth, 304, 257-263 (2007)
6. Pulsed Laser Deposited Nanostructured InN Thin Films as Field Emitters
   K. P. Adhi, Sanjay Harchirkar, Suhas M. Jejurikar, P. M. Koinkar, M. A. More, D. S. Joag, L. M. Kukreja
   Solid State Communication 142, 110 -113 (2007)
7. Structural, morphological and electrical characterization of hetroepitaxial ZnO thin films deposited on Si (100) by pulsed laser deposition: Effect of annealing (800 ^{o}C) in air

S. M. Jejurikar, A. G. Banpurkar, A. V. Limaye, S. K. Date, S.I. Patil, **K. P. Adhi** , P. Misra**,** L. M. Kukreja**,** Ravi Bathe

J. Appl. Phys. 99, 014907 (2006)

8. Influence of magnetic (Fe^{+3}) and non – magnetic (Ga^{+3}) ion doping at Mn – site on the transport and magnetic properties of $La_{0.7}Ca_{0.3}MnO_3$

   M. S. Sahasrabudhe, S. I. Patil, S. K. Date and **K. P. Adhi**, S. D. Kulkarni, P. A. Joy, R. N. Bathe

   Solid State Communication 137, 595-600 (2006)

9. Swift ion irradiation induced changes in the structural and transport properties of $La_{0.7}Sr_{0.3}MnO_3$ thin films

   M. S. Sahasrabudhe, **K. P. Adhi**, S. S. Harchirkar, A. V. Deshmukh, S. I. Patil, Ravi Kumar

   Nucl. Instr. and Methods in Phys. Res. (NIM B) vol.224, issue 2, 333 - 337 (2006)

10. Growth and properties of pulsed laser deposited Fe_3O_4 / $La_{0.7}Ca_{0.3}MnO_3$ bilayers

    S. N. Sadakale, R. J. Choudhary, M. S. Sahasrabudhe, A. G. Banpurkar, **K. P. Adhi**, S. I Patil, S. K. Date

    J. Magnetism and Magnetic Materials (JMMM) vol. 286, 450 – 454 (2005)

11. Phase separation scenario in Ba doped $LaMnO_3$

    S. I. Patil**,** M. S. Sahasrabudhe, S. N. Sadakale, P. R. Sagdeo, R. N. Bathe, **K. P. Adhi** , S. K. Date, S. M. Bhagat

    Phys. stat. solidi part – c, 1, 3623 (2004)

12. Chemical modifications in femtosecond ultraviolet (248 nm) excimer laser radiation-processed polyimide

    K. P. Adhi, Roger L. Owings, Tarak A. Railkar, W. D. Brown and A. P. Malshe

    Applied Surface Science vol 225, 324 -331 (2004)

13. Femtosecond ultraviolet (248 nm) excimer laser processing of teflon (PTFE)

    K. P. Adhi, Roger L. Owings, Tarak A. Railkar, W. D. Brown and A. P. Malshe

    Applied Surface Science Vol 218/1-4, 17-23 (2003)

14. Effect of ^{57} Fe ion implantation on magnetotransport in epitaxial $La_{0.67}Ca_{0.33}MnO_3$ thin films

    Ravi Bathe, S. I. Patil, **K. P. Adhi** , B. Hannoyer ,G. Marest

    J. Appl. Phys. Vol. 93 (2) 1127 –1131 (2003)

15. Effect of Al doping on the magneto-transport properties of $La_{0.75}Ca_{0.25}MnO_3$

    Ravi Bathe, S. R. Shinde, K. M. Gapchup, **K. P. Adhi** and S. I. Patil

    J. Magnetism and Magnetic Materials (JMMM) vol. 256, No. 1-3, 425 – 429 (2003)

16. Differences in the dynamic scaling behavior of droplet size distribution for coalescence under pulsed and continuous vapor delivery.
    R. D. Narhe, M. D. Khandkar, **K.P.Adhi**, A. V. Limaye, S. R. Sainkar, S. B. Ogale
    Phys. Rev. Lett. Vol. 86, no. 8, 1570 (2001)
17. Improvement in crystalline quality of ZnSe thin films grown on GaAs by pulsed laser deposition in He ambient.
    Tapas Ganguli, M. Vedvyas, P. Bhattacharya, L. M. Kukreja, Alka Ingale, **K.P.Adhi**,, K. S. Chandrashekharan, B. M. Arora, K. C. Rustagi
    Thin Solid Films vol. 388, issue 1-2, 189 –194 (2001)
18. Silver ion implantation in epitaxial $La_{2/3}Ca_{1/3}MnO_3$ thin films: large temperature coefficient of resistance for bolometric application.
    Ravi Bathe, **K.P.Adhi**, S. I. Patil, B. Hannoyer, G. Marest, S. B. Ogale
    Appl. Phys. Lett . vol. 76, no. 15, 2104 (2000)
19. Kinetics of pulsed laser ablation- deposition process: A case study of the ablation of α - Fe_2O_3 in hydrogen.
    K.P.Adhi, Shilpa Kale, Sushama Joshi, A.V.Limaye , S.B.Ogale and G. Marest
    Inter. J. Modern Phys. B Vol. 11, No. 13, 1619 - 1633 (1997)
20. Role of silver doping in oxygen incorporation of oxide thin films.
    D. Kumar, S. Oktyabrsky, R. Kalyanaraman, J. Narayan, P.R. Apte, R. Pinto, S.S. Manoharan, M. S. Hegde, S.B. Ogale, **K.P. Adhi**
    Materials Science & Engineering B 45 (1-3), 55 - 58 (1997)
21. Synthesis of ultrafine / nanosize powders of iron oxides by pulsed laser ablation and cold condensation.
    S.R. Shinde, A.G. Banpurkar, **K.P. Adhi**, A.V. Limaye, S.B. Ogale, S.K. Date and G.Marest
    Modern Phys. Lett. B, 10 (30), 1517 - 1527 (1996)
22. Optical spectroscopy study of pulsed excimer laser generated plasma from CuO.
    K.P.Adhi, Shilpa Kale, Yogesh Padhye, A.V.Limaye and S.B.Ogale.
    Inter. J. Modern Phys. B Vol.9, No. 27, 3571 - 3583 (1995)
23. Optical spectroscopy study of role of Ag in laser ablated $YBa_2Cu_3O_{7-\delta}$ thin films.
    R. Pinto, P.R. Apte, **K.P. Adhi**, S.B. Ogale, D. Kumar, M.S. Hegde
    J. Appl. Phys., 78 (8), 5204 (1995)

II. Laser Design / Development :

24. A low cost, fast switch using stack of bipolar transistors as a Pockell's Cell driver.
    A.K. Dharamadhikari, J.A. Dharamadhikari, **K.P. Adhi**, N.Y. Mehendale and R.C. Aiyer.

Rev. of Sci. Instrum. 67 (12) , 4399 (1996)

III. Hard coatings by Laser / Pulsed Laser Deposition :

25. Energetic Deposition and Surface Characterization of Thin Carbon Films on Nickel
    K.P.Adhi, A.K. Sharma, S.S. Wagal, D.S. Joag and S.K. Kulkarni
    Modern Phys. Lett. B Vol. 12, No. 10, 383 - 391 (1998)
26. Synthesis of Crystalline Carbon Nitride Thin Films by Laser Processing at a Liquid – Solid Interface.
    A.K.Sharma, P.Ayyub, M.S.Multani, **K.P. Adhi**, S.B. Ogale, M. Sunderaraman, D.D. Upadhyay, S. Banerjee
    Appl. Phys. Lett. 69 (23), 3489 (1996)
27. A Study of Laser Ion Deposited Carbon Films by Field Ion Microscopy, Low Angle X ray Diffraction and Electron Spectroscopy.
    S.S. Wagal, **K.P. Adhi**, D.S. Joag, A.K. Sharma, N. Abhyankar, S.K. Kulkarni.
    J. Appl. Phys., 71 (2), 1052, (1992)

B. National Journals

28. Pulsed Laser Induced Deposition and Synthesis of Materials.
    K.P.Adhi
    Laser News Vol. 8, No. 4, 5 - 10 Oct. (1997)

7. Publications – Conference presentations:

International conferences:

1. Performance and Stability of ZnO Thin Film Transistors with SiO_2, SiN and AlN Gate Insulators *(Invited Talk)*
   M. M. De Souza, S. Jejurikar, K. P. Adhi
   2nd International Symposim on Transparent Conductive Oxides held at **Hersonissos, Crete, Greece** from **22nd to 26th Oct. 2008**
2. Performance and the stability of ZnO TFT`s with SiO_2, SiN and AlN insulators *(Invited Talk)*
   M. M. DeSouza, R. B. Cross, D. Ngwashi, S. M. Jejurikar, K. P. Adhi
   Materials Research Society (MRS) – 2007, held at Boston – USA during **26th – 30th Nov. 2007.**
3. Nanostructured GaN and InN films for field emission devices *(Invited Talk)*
   K.P.Adhi, Suhas M. Jejurikar, P. M Koinkar, M. A. More, D. S. Joag, L. M. Kukreja

IUMRS – International conference on advanced materials (ICAM – 2007) held at **Grand Ashoka International, Bangalore** during **8th to 13th Oct. 2007**

4. Chemical Analysis of as deposited and annealed ZnO thin films grown by pulsed laser deposition

   S. M. Jejurikar, S. S. Ashtaputre, S. K. Date, S. K. Kulkarni, K. P. Adhi, L. M. Kukreja

   "India – Japan Workshop (IJW-2006) on ZnO Materials and Devices" held at **New Delhi, India** between **18th – 20th Dec. 2006**. Proceedings Pg-125, (2006)

5. Femtosecond excimer (248 nm) laser micromachining of Teflon (PTFE)

   K.P. Adhi, R.L. Owings, Tarak Railkar, William D. Brown, and **Ajay Malshe**

   Proc. of ASME Int. Mechanical Eng. Congress and Exposition (2001) pp. 1-9.

6. Delivered a talk at one of the prestigious "Gorden Research Conference" held at Salve – Reginia University – Rhode Island, Providence USA during May 2000. Title : Femtosecond laser processing of Diamond films"

7. Reactive processing of CVD diamond substrates in liquid ambient by second harmonic of Nd:YAG laser.

   Beom S. Park, **Ajay P. Malshe**, William D. Brown and K.P.Adhi

   Proc. of **MECE (2000) pg. 245 – 249 "ASME Conference"** held at **Orlando**, **Florida USA.** During **5th to 10th Nov. 2000**

8. Femtosecond pulsed laser-induced micromachining of difficult to machine materials: diamond a case study.

   A. **P. Malshe**, A. M. Ozkan, T. A. Railkar, K.P.Adhi, and W. D. Brown

   Proc. of **MECE (2000) pg. 973 – 978 "ASME Conference"** held at **Orlando, Florida USA.** During **5th to 10th Nov. 2000**

9. Characterization of Epitaxial ZnSe Films grown by Pulsed Laser Deposition.

   Tapas Ganguli, Alka Ingale, Vedvyas M, Pijush Bhattacharya, L.M.Kukreja, **K.P.Adhi** and K.C.Rustagi

   "**IXth International Conference on Physics of Semiconductors**"held at **New Delhi** during **16th to 20th Dec.97 P. 1181**

National conferences:

10. Delivered a talk at " Pulsed Lased Deposition Symposium -01" held at Centre for Advanced Technology, CAT, Indore during $26^{th} - 27^{th}$ Nov. 2001
11. Raman and Photoluminescence Investigations of Epitaxial ZnSe Films on n-GaAs (100)

    Alka Ingale, **Tapas Ganguli**, P. Bhattacharya, L.M.Kukreja, M.Vedvyas, K.P.Adhi, K.C.Rustagi.

    "DAE Solid State Physics Symposim " held at Cochin from 27^{th}-31^{st} Dec. 97.
12. Delivered a talk at **"Workshop on Applications of Lasers in Mechanical Industry (WALMI-97)",** held at **Jadhavpur University, Calcutta** during **21^{st} - 24^{th} Dec.`97.**

    Title: Diagnostics of Pulsed Laser Generated Plasma by Optical Spectroscopy : Applications to Thin Film Growth
13. Delivered an invited talk at **"National Laser Symposium - 97",** held at **Centre for Advanced Technology, Indore** during **6^{th} - 8^{th} Feb. 97.**

    Title : Pulsed Laser Induced Deposition and Synthesis of Materials.

    Also Published in ***Laser News Vol. 8, No. 4, 5 - 10 Oct. (1997)***
14. Photoluminescence Study on Carbon Embedded Porous Silicon Samples obtained by Laser Evaporation and Cold Condensation Process

    A.G.Banpurkar, L.V.Saraf, K.P.Adhi and S.B.Ogale

    "National Conference on Science and Technology of Surfaces and Interfaces " held at **Indian Institute of Technology - Kharagpur** during **16^{th} - 18^{th} Dec. 1996.**
15. Optical Spectroscopy of Pulsed Laser Ablation from Fe_2O_3 in Hydrogen and Analysis of the Correlation between Plasma and Film Properties

    Shilpa Kale, Sushama Joshi, A.V. Limaye, K.P.Adhi and S.B. Ogale

    National Laser Symposium held at **Dehradun** during Feb., 95
16. Delivered an invited talk at **"Workshop on Applications of Lasers in Mechanical Industry (WALMI-96)",** held at **Jadhavpur University, Calcutta** during **7^{th} - 8^{th} Feb. 96.**

    Title : Material Synthesis and Modification by Laser Beams.

17. Delivered an invited talk at **"National Laser Symposium - 96",** held at **BARC, Bombay** during **17th - 19th Jan.96.**

    Title : Laser Based Nanosize Particle Generation and Etching of LCMO (GMR) Films.

18. Delivered two lectures on Lasers and its Applications in a two day workshop on **"Lasers and its Applications**", at **Shrirampur** during **March 93.**

8. Professional Societies Membership:

- Life member Indian Physics Association (IPA)
- Life member of Materials Research Society – India

9. Public service / University service/ Consultancy service:

- Delivered lectures in different colleges / refresher courses held at different places (apart from Physics Department UoP)
- Active participation in setting up experiments for "Science day"
- Active participation in "Transport committee for VC- Conference" held at UoP, Pune.
- Active participation in different committees of the Physics Department viz. Information committee, Examination committee, M.Phil. Committee etc.

10. Projects (Major Grants / Collaborations)

1. Project coordinator on a DAE funded scheme entitled "Laser Material Processing" under National Laser Program since 1996 – 2001 ***(completed)***
2. Laser scribing of solar cells - A project funded by EcoSolar Pvt. Ltd., Pune. ***(completed)***
3. Indian Investigator ***(for last 7 months of the project duration)*** on Indo - French project entitled " Ion Beam induced Phase and Property Modifications in advanced Ceramics " ***(completed)***
4. ***Principal Investigator of the Scheme - "Pulsed Laser Deposited, Epitaxial Thin Films of GaN, AlN and InN and its structural, optical and Electrical Properties" funded by DAE - BRNS. (completed)***
5. Principal Investigator of the scheme entitled "Study of laser – matter interaction" funded by DRDO for a period of two years. ***(completed)***