

## **RESUME:**

### **DR. K. RAJEEV KUMAR**

(Associate Professor & Head, Department of Instrumentation, Cochin University of Science & Technology, Cochin – 682 022, INDIA  
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### **AREAS OF RESEARCH INTEREST**

Experimental condensed matter physics, Thin Film phenomena, Preparation and Characterization of high-k films, Materials Science, Nano materials, Atomic Layer Deposition.

### **EDUCATION:**

Doctor of Philosophy (Ph.D.) in Solid State Physics, Cochin University of Science & Technology, India, 1990

Master of Science (M. Sc.) in Physics, University of Cochin, India, 1982

Bachelor of Science (B.Sc.) in Physics, University of Kerala, India, 1980

### **INDUSTRIAL EXPERIENCE (10years)**

Scientist and Head, Optical Coating section (Job involved design and fabrication of various multi layer dielectric coatings), M/s Harvin Scientific Optics P (Ltd), Hyderabad, 1989-1993

Quality Control Manager, Design and Fabrication Section, M/s Hind High vacuum systems, Bangalore, 1994 -1997

Senior Scientist, High Vacuum systems, M/s Indovision, Bangalore, 1997-1999

### **TEACHING EXPERIENCE (Undergraduate and Post Graduate levels) (15 years)**

Associate Professor, Cochin University of Science & Technology, Department of Instrumentation. Kerala, India.

### **RESEARCH GUIDANCE**

Number of scholars currently working for Ph. D: 6

## **VISITING ASSIGNMENTS**

Technical University of Delft, The Netherlands (2001)

## **Research Projects.**

Completed: 4 (Funding agencies: KSCSTE, AICTE, UGC, DST)

Ongoing : 1 (Funding agencies: KSCSTE)

## **MEMBERSHIP IN PROFESSIONAL BODIES**

Life Member, Plasma Science Society of India

Life Member, Indian Vacuum Society

## **PUBLICATIONS** (During last 5 years)

Research papers published/communicated in journals: 17

Research papers presented in conferences: 16

## **PERSONNAL**

Age and Date of birth: 55 Years, 15 April 1959

Family status: Married, with one son, aged 19

## **Publications during the last five years (Journal)**

### **2014**

- (1) "Tuning The properties of sprayed CUZNS films for fabrication of Solar cell" Sudha Kartha, K.Rajeev Kumar and K.P.Vijayakumar. (Applied Physics Letters, 105,202107(2014); doi:10.1063/1.4902224
- (2) "Spray pyrolysed microporous TiO<sub>2</sub> thin films by optimization of substrate temperature for 'all sprayed' solar cells", MV Santhosh, D R Deepu, R.Geethu, K.Rajeev Kumar, C.Sudha Kartha and K.P.Vijayakumar. Semicond.Sci.Technol. 29(2014)1 15026 (7pp)
- (3) "Fabrication of transparent thin film heater based on highly conducting tin oxide thin films by chemical spray pyrolysis"  
D.R. Deepu,<sup>1</sup> C. Sudha Kartha,<sup>1</sup> K. Rajeev Kumar,<sup>2</sup> and K.P. Vijayakumar (Comunicated) (2014)

- (4) "Investigation on Electromagnetic Enhancement in SERS active silver nanocubes and its potential application for label free detection of DNA". K.Hasna, M.K.Jayaraj and **K.Rajeev Kumar**. (Communicated, 2014)
- (5) "Temperature dependence of molar polarization of Al<sub>2</sub>O<sub>3</sub> gate oxide deposited by atomic layer deposition". Subin Thomas, Anu Philip and K.Rajeev Kumar (Communicated, 2014)
- (6) Effect of frequency and bias voltage on the electrical and dielectric properties of atomic layer deposited Al/Al<sub>2</sub>O<sub>3</sub>/p-Si MOS structure at room temperature. Anu Philip, Subin Thomas and K.Rajeev Kumar (Accepted, Indian Journal of Pure & Applied Physics, 2014)
- (7) 'Compositional characterization of atomic layer deposited alumina' Anu Philip, Subin Thomas and **K. Rajeev Kumar**. American Institute of Physics Conference Proceedings 1576, 183 (2014); doi: 10.1063/1.4862015
- (8) Calculation of growth per cycle (GPC) of atomic layer deposited aluminium oxide nano layers and dependence of GPC on surface OH concentration. Anu Philip, Subin Thomas and **K.Rajeev Kumar**, (Pramana-J.of Physics, Vol. 82, No. 3, March 2014, pp.563-569 [doi:10.1007/s12043-014-0715-8](https://doi.org/10.1007/s12043-014-0715-8))

## **2013**

- (9) 'Synthesis of chemically pure, luminescent Eu<sup>3+</sup> doped Hap nanoparticles: a promising fluorescent probe for in vivo imaging applications'. K.Hasna, S.Sasankakumar, Manoj Komath, Manoj Raama Varma, M.K.Jayaraj, and **K.Rajeev Kumar**. Phys.Chem.Chem.Phys. 2013,**15**,8106.

## **2012**

- (10) Synthesis of ZnO nanostructures using domestic microwave oven based remote plasma deposition system' Rehana Raj and **K.Rajeev Kumar**. 'Nano science and Nanotechnology', 2(3): p 66-70, 2012. DOI: 10.5923/j.nm.20120203.04
- (11) 'Power Absorption analysis of Coconut Oil in a Microwave Oven with Various Parameters', Smitha I.S, Juno Devassy, Akhil Gopalakrishnan, **K. Rajeevkumar** International Journal of Applied Information Systems (IJAIS) ISSN: 2249-

0868, Vol.1, No.5, Feb. 2012 (New York, USA), DOI: 10.5120/ijais12-450178

- (12) “Effect of power variation in a Microwave film deposition unit with different loads.” Smitha I.S, Anish Mathew K, Akhil Gopalakrishnan, Juno Devassy, K.Rajeev Kumar. IEEE xplore. 2012 International Conference on Computing, Electronics and Electrical Technology [ICCEET], (2012)

### **2011**

- (13) Low cost Microwave Plasma Generation System- A Power Analysis Study. Smitha I.S, Sreejith K R, Anish Mathew K, **K.Rajeev Kumar**, International Journal of Computer Applications (IJCA), Vol.30, No12, Oct. 2011  
DOI:10.5120/3708-5144 (Foundation of Computer Science, New York, USA)

- (14) Absorbed Power Measurement in a 2.45 GHz Microwave Oven at Variable Load and Magnetron Input Voltages.  
Rehana Raj, Smitha, Subin Thomas, **K.Rajeev Kumar**.  
International Journal of Computer Applications (No.1, Article.1, June 2011)  
ISBN-978-93-80746-43-3 (Foundation of Computer Science,  
New York, USA)

### **2010**

- (15) On adsorption of Aluminium and Methyl groups on silica for TMA/H<sub>2</sub>O process in Atomic Layer Deposition of Aluminium Oxide nano layers.”  
Anu Philip and **K.Rajeev Kumar**.  
Bulletin of Material Science, Vol. 33, No.2, April 2010.
- (16) Design and fabrication of an Atomic Layer Deposition system for the deposition of Al<sub>2</sub>O<sub>3</sub> nano layers for MOSFET gate applications.”  
Anu Philip, Johny Issac and **K.RajeevKumar**

Journal of Instrument Society of India, Vol. 40, No. 4, December 2010.

(17) Explanation for the appearance of alumina nanoparticles in a Cold Wall

Atomic Layer Deposition System and their characterization

Anu Philip, Subin Thomas and **K. Rajeev Kumar**

J.Vacuum, 85, Issue 3, pp 368 (2010).

**DETAILS OF RESEARCH PROJECTS AS PRINCIPAL INVESTIGATOR**

Title	Funding agency	Year of sanction	Amount	Status
1)“Preparation of High-K Dielectric coatings using plasma enhanced atomic layer deposition and their characterisation	KSCSTE	2006,3years	10.89 lakhs	Completed
2) “Investigations on the interface trap densities in pseudobinary oxide nano layer-silicon systems prepared by Atomic Layer Deposition for MOSFET applications”.	AICTE	2007-08	6.8 lakhs	Completed
3) “Design and fabrication of a Microwave plasma..... high-k dielectrics deposited by the same.”	DST	2009-10	17.8 lakhs	Ongoing.
4)“Preparation of high-k polymer thin films loaded with ceramic nano particles ...flexible thin film transistors.”	UGC	2010-11 3years	7.28 lakhs	Ongoing
5) “Investigations on the preparation of multi layers of high-k material ..... characterization”	KSCSTE	2011-12	11.9 lakhs	Ongoing