

CURRICULUM VITAE



1. Name : Dr. J. KUMAR, MSc. Ph.D.(India), DSSTM(Italy)

2. Designation & : PROFESSOR
Address Crystal Growth Centre
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Awards and/ or other recognitions received:

- Jawaharlal Nehru Memorial Award – 1981
- MHRD Scholarship For Study Abroad – 1987 – 1989
- ICTP, Italy, Grant Assistance – 1987 – 1989
- CSIR Visiting Associateship – 1991 – 1993
- ICTP, Italy Grant – 1991
- DST SERC Visiting Fellowship – 1993
- ICTP, Italy Scholarship – 1994
- **DAE Young Scientist Award – 1995**
- Fellow, Tamil Nadu Academy Of Sciences & ICTP, Italy Scholarship – 1996
- Member – Indian Space Research Organisation's Standing Working Group for Microgravity Research Activities in India : Materials Processing in Space – 1998
- Research Manager – Electrotechnical Laboratory, Tsukuba, Japan – 1 – 19, March 1999
- Reviewer – International Journal of Nuclear Instruments and Methods in Physics Research B: Beam Interactions with Materials and Atoms – 1999
- Researcher – INFN, University of Lecce, Italy – 2000 June to 2002 June
- Referee – Journal of Crystal Growth, Journal of Materials Letters, Indian Journal of Pure and Applied Physics, Materials research bulletin, NIMB, Appl. Phys. Letters, Journal of Crystal Growth & Design
- Executive Committee Member – Tamil Nadu State Council for Science & Technology – 2006
- Visiting Professor– University of Illinois at Chicago –April –June 2008
- Visiting Research Professor – Dongguk University, Seoul, S.Korea – Sep 09 – Feb 2010
- Member – Board of Studies – Physics, Bharathidasan University, Trichy – 2010 – 13
- Member –Research Advisory Council – Loyola College, Chennai – 2010
- UGC –Special Assistance Program Advisory Committee Member – Bharathiar University – 2011
- UGC –Special Assistance Program Advisory Committee Member – Nagpur University – 2011
- **Governing Council Member** – UGC nominee – Inter University Accelerator Centre – 2011 – 13
- **Active Consultant Award – Anna University – 2011**
- Visiting Professor– University of North Carolina at Charlotte – Sep – Nov 2013
- Asia Pacific Academy of Materials Academician – 2013
- TAMILNADU SCIENTIST Award for Physical Sciences – 2012
(Tamilnadu State Council for Science & Tech awarded in 2014

Field of specialization:

TECHNOLOGICALLY IMPORTANT CRYSTALS AND DEVICES

Currently, working on the MOCVD growth of GaN – AlN – InN

Working on the synthesis, CVD deposition and Characterization of Gallium Nitride and related alloys and on dilute magnetic semiconductors

Working on the deposition and sol – gel processing of ZnO and related alloys.

Working on first principle calculations of half – metallic effect in Heusler type Co – Fe – Si alloy thin films

Growth and characterization of PZN – PT and related single crystals

Targeted drug delivery systems & BIOSENSOR

Carried out PhD research work on YAG and NdBorate crystals at Anna University, Chennai and carried out research work at IMEM (formerly known as MASPEC, Parma) on InP single crystal growth and characterization and obtained the title of Dip in Scienza e Tecnologia dei Materiali from University of Parma, Parma

Had worked at University of Lecce, Italy on the MOCVD of InGaAs Quantum Dots on GaAs substrates to realise lasers emanating at 1.3 micron. Was completely involved on the epitaxial activity of photonic band gap crystals, layers for Quantum computation, Solar cell structures of high efficiency, DBR structures with emphasis on GaAs based substrates. *Characterization of the grown layers using AFM and PL measurements.* Further, was growing epilayers of InGaN and GaN on sapphire substrates using the AIXTRON MOCVD system.

India's first Gallium Arsenide (GaAs) single crystal of 1 Kg weight and 2 inch diameter was grown at the Crystal Growth Centre. Similarly, with my total involvement India's first single crystal of Indium Phosphide (InP) has also been grown. Had fabricated several device structures using GaAs and InP crystals.

Teaching and Research Experience:

- Teaching : UG : 25Years (B.Arch, B.Tech and B.E.: ECE & EEE)
PG : 25 Years (M.Sc., M.Phil., M.Tech. Ph.D.)
- Research : 31 years

Research Guidance Ph.D : Twenty One (Awarded) Five (in Progress)

M.Phil – Eight ; M.Tech: Two M.Sc : Seven

Total number of publications: International : 146 National : 10

Conference Proceedings : 22 Communicated : 3

Papers presented in the conferences: 157 (National) 71 (International)

Short – term courses attended/chaired: Participated : 83; Invited lectures : 87

Membership in Professional Bodies: Indian Laser Association – Life Member

Countries visited :

Countries visited	Period of Visit From To	Purpose
Italy	Aug. 1987 – Dec.1989	Research and Training
Italy	18.11.91 – 06.12.91	Intl. School and Research
Italy	13.05.94 – 18.06.94	Intl. Conf. and Research
Italy	08.03.96 – 29.03.96	Intl. Workshop and Research
Germany	01.04.96 – 04.04.96	Deliver Lecture and Discussions
Japan	01.03.99 – 19.03.99	Research (MBE growth of GaAs on Silicon)
Singapore	07.10.99 – 10.10.99	Intl. Conference
Japan	11.10.99 – 24.10.99	Intl. Conference and Research
Italy	June 2000 – June 2002	Research
China	11.10.05 – 21.10.05	Conference and Research
USA, Germany and Sweden	29.04.06 – 08.05.06	Research
Italy	17.04.06 – 15.06.06	Research
Italy and England	11.11.06 – 27.11.06	Research
Japan	14.03.07 – 28.03.07	Research and Intl. Conference
Italy	01.05.07 – 05.05.07	Research to Business Meet
USA	12.08.07 – 18.08.07	International Conference
Korea	20.10.07 – 24.10.07	International Conference & Research
Germany	09.12.07 – 13.12.07	MOCVD system approval & training
U.S.A.	01.04.08 – 30.06.08	Visiting Research Professor
Japan	17.09.08 – 22.09.08	International Conference
U.S.A.	25.06.09 – 30.06.09	Brain Storming Meet on Solar cells
China	13.10.09 – 20.10.09	International Conference and Research
Thailand	21,22 Dec 2009	International Conference
Taiwan	27.01.10 – 02.02.10	Research
Korea	10.09.09 – 13.02.10	Research
China	06.08.10 – 13.08.10	International Conference and Research
Korea	09.12.10 – 11.12.10	International Conference and Research
Italy	07.06.11 – 11.06.11	Research to Business Meet
USA	11.08.12 – 18.08.12	International Conference
UK	04.03.13 – 08.03.13	Building Global Engagements Meeting
USA	09.09.13 – 09.11.13	Visiting Professor, UNCC
UK	18.05.14 – 21.05.14	Knowledge Economy Partnership Meeting

On going Research Projects

Title of the Project	Duration	Funding	Amount Rs
● Nottingham – Anna University Research and Training Partnerships in Materials Technology	1 Year	British Council	14,900,00
● Investigations on Swift heavy ion irradiation on PZN – PT thin films	3 Years	IUAC	6,51,000
● Investigations on rare earth doped nitride semiconductors for Neutron detection	3 Years	UGC-DAE	6,51,000

Completed Research Projects

Title of the project	Funding Agency	Amount (Rupees)
Germanium crystal growth	ISRO	13,00,710
Investigations on Gallium Nitride	DST	13,45,000
Development of Room Temperature Radiation Detectors (GaAs)	AICTE	10,00,000
Growth and characterization of Semiconductor crystals	DAE – Young Scientist Award	5,00,000
Establishment of the PhotoLuminescence system for the evaluation of III – V crystalline wafers	University Grants Commission	5,79,800
Investigations on LEC grown III – V crystals through Deep Level Transient Spectroscopy	Department of Science and Technology	11,41,112
Growth of bulk single crystals of Gallium Arsenide and Indium Phosphide single crystals and preparation of polished wafers	Department of Electronics	50,00,000
Establishment of an Electro – Optic Coefficient set – up	Third World Academy of Sciences (Italy)	1500 (USDollars)
Growth and supply of 2.3 inch dia GaAs single Crystals	DRDO	2,00,000
Ion implantation studies on GaAs and InP crystals	IUC – DAEF	1,76,000
Growth and characterization of GaN & alloy systems to fabricate UV detectors	University Grants Commission	2,57,000
Radiation Detectors & Irradiation studies on semiconductor device structures	IUAC	1,76,000
State Initiated Establishment of National Facility for Semiconductor Materials and Devices for Nanotechnology	Tamil Nadu State	50,00,000
Crystal growth & characterization of Electronic Materials for Nanoscience and Technology & Spintronics	Dept. of Science & Technology	12,00,000
Program on Optoelectronics (Telecommunications Technology)	European Union	35,00,000
Gallium Nitride and alloy systems for Nano Electronics	AICTE	9.60,000
Nanostructure formation of Metal – Semiconductors, Growth and Characterisation of DMS Materials using Swift Heavy Ions	Inter University Accelerator Centre	4,19,,000
Semiconductor Nano Structures	DST	6,22,97,000
Capacitance and conductance based sensor instrumentation for Biochemical characterisation	Dept. of Science & Technology	13,55,000
Piezoelectric single crystals of PZN – PT for enhanced acoustic transducer and sensor applications	DRDO	9,96,000
Growth and characterization of Gallium Nitride and related alloy heterostructures	DST	1,80,92,800
Validation of auto range capacitance measurement instrumentation as clinical biochemical analyzer	DST	20,62,080
First Principle studies on electronic structure, magnetism and half – metallic effect in Heusler type Co – Fe – Si alloy thin films	DMRL	16,25,000

Consultancy Activities:

1. The crystalline wafers of GaAs, InP, Germanium and PZN – PT have been supplied .
2. Have designed and fabricated a crystal Puller which is marketed by a firm to other institutions

PATENT in Process – on BIOSENSORS

Conferences and short – term courses organized:

- Convener : National Symposium on " Current Status on Solar Energy Materials and Systems " – Feb 24 – 25, 1997.
- Director: School on Materials for Advanced Research & Techn. "SMART-97" Oct 3–7, 1997.
- Co – Convener : Ninth National Seminar on " Crystal Growth " – Feb 24 – 26, 2003.
- Coordinator: Tutorial on Nanotechnology – Dec 15, 2003
- Technical Chair & Jt. Secretary : 12th International Workshop on the Physics of Semiconductor Devices – Dec 16 – 20, 2003.
- Co – Director : International Workshop on "Crystal Growth & Characterisation of Technologically Important Materials" – Feb 24 – 28, 2004.
- Co – Coordinator : UGC Refresher course on Crystal Growth & Characterisation – Nov 17 to Dec 7 2004.
- Coordinator : INDO – JAPAN Workshop on Crystal Growth & Characterisation of Advanced Materials for Optoelectronics – Dec 7 – 10, 2004
- Coordinator : Seminar on Physics with Home Made Equipments and Innovative Experiments - March 14 & 15, 2005
- **Chairman – International Workshop on Crystal Growth and Characterisation of Advanced Materials – 9 – 13 Jan 2006 – Sponsored by IuCr**
- Convener – International Symposium on Solid State Lighting – 21 & 22 July 2006
- Co – Coordinator – Refresher course in Experimental Physics – 28 May to 10 June 2007
- Convener – Awareness Program on Nano Science and Technology – 19 & 20 Sep 2007
- Coordinator : Seminar on Energy Materials and Systems Jan 10 & 11, 2008
- Chairman – Indo – US workshop on Visible and UV light sources for solid – state illumination and Water purification – 5 – 7 January, 2009
- Coordinator – Workshop on Recent Trends in Crystal Growth – 30 March 2010
- International Advisory Committee Member – ICCG – 16 and ICVGE – 14 (Aug 8 – 13, 2010)
- National Advisory Committee member – Conference on Nanotechnology and Biosensors – March 03 – 04, 2011
- International Technical Committee member – International Conference on Advanced Materials – Dec 12 – 16, 2011
- Co – Convener: Asia – Pacific Workshop on Materials Characterisation – Sep 22 – 24, 2011
- Coordinator – Indian Laser Association Course on Crystal Growth and Characterisation – Jan 07 – 08, 2012
- International Committee member – 4th Intl Conf on White LEDs and SSL – Aug 12 – 16, 2012
- Coordinator – Management Training Program for Engineering Students – March 02, 2013
- Coordinator – Engineering Examinations Training Program – 09 Mar 13
- International Advisory Committee Member – ICCGE – 17 – Aug 11 – 16, 2013
- National Advisory Committee member – National Conference on Recent Trends in Advanced Materials – December 16 and 17, 2013
- Convenor – International Workshop on Electronic Materials Technology, 13 – 15, Mar 2014
- International Advisory Committee Member – International Conference on Advances in Magnetism and Magnetic Materials – Sep 18 – 20, 2014

Brief information on Academic Standing:

- Had presented lectures for 23 TV programs under UGC program (as Subject Expert)
- *Good Knowledge of Italian language*
- Have attended a German language course of 200 periods of 45 minutes and passed the final written and Oral examinations.
- M.S. & Ph.D. thesis examiner
- In August 2004 Published a book on Engineering Physics –Volume I
- Book on Engineering Physics – August 2006
- Book on Engineering Physics II – Feb 2009
- Book on Engineering Physics – August 2009
- Book on Engineering Physics in Tamil – 2 chapters – August 2010