



Dr.K.Sankaranarayanan
Professor

Contact

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Academic Qualifications: M.Sc., M.Phil., Ph.D.

Degree	University	Subject	Year	Class
Ph.D	Alagappa University, Karaikudi	Physics- Crystal Growth	2006	---
Thesis Title	"Introduction Of Novel Crystal Growth Methods And Synthesis Of Indium Phosphide Polycrystalline Material"			
M.Phil.,	Madurai Kamaraj University, Madurai	Physics	1990	I Class
M.Sc.,	Madurai Kamaraj University, Madurai	Physics	1989	I Class

Teaching Experience: 21 Years

Research Experience: 24 Years

Additional Responsibilities

1. Chairperson, School of Physical Sciences
2. Director, University Scientific Instrumentation Centre
3. Co-ordinator, Intellectual Property Rights Cell.

Areas of Research

1. Materials Science
2. Crystallization kinetics of organic and inorganic materials.
3. Unidirectional growth of bulk organic and inorganic crystals.
4. III-V Semiconductor materials – synthesis and growth.

Research Supervision / Guidance

Program of Study		Completed	Ongoing
Research	Ph.D.	1	6
	M.Phil.	36	2
Project	PG	40	5

Publications

International		National		Others
Journals	Conferences	Journals	Conferences	Books / Chapters / Monographs / Manuals
55	25	--	30	3

Cumulative Impact Factor (as per JCR) : 180
h-index : 16
i10 index : 28
Total Citations : 942

Funded Research Projects

Completed Projects

S. No	Agency	Period		Project Title	Budget (Rs. In lakhs)
		From	To		
1	AICTE	1996	1998	"Development of Indigenous Technology to Synthesize Indium Phosphide"	2.00
2	CSIR	1998	2000	"Growth of NLO Single Crystals by Low Temperature solution growth technique"	3.18
3	DST	2001	2002	"Production of Indium Phosphide Polycrystalline: An advanced III-V compound semiconductor material"	13.86
4	DRDO	2004	2007	"Growth of ZnO Single Crystals and Preparation of Polished Wafers for Nitride Epitaxy"	18.00
5	Alagappa University	2009	2011	Unidirectional Crystallization of Pure and Metal ion doped KDP crystal for SHG application.	0.64

Consultancy Projects - as Deputy Co-ordinator

S. No	Agency	Period		Project Title	Budget (Rs. In lakhs)
		From	To		
1	UGC-SAP (DRS-III)	2015	2020	Preparation of crystals, Thin films and Battery materials for devices	105
2	DST-FIST Level II	2015	2020	Growth and study of different metal oxide thin films for gas sensors and memory devices	144

Patents

1. "Development of a novel material CuCdS as a UV Sensor". Appl.No. 693/CHE/2010: Dt.10.2.2011 and
2. "A System For Growing A Unidirectional Organic Single Crystal Compound And Method Thereof" Appl.No. 201641011210, Date:30.3.2016

Distinctive Achievements / Awards

1. **Indo-China Bilateral Students Exchange Fellowship (1992-93)** by Ministry of Human Resource Development, Govt. of India, New Delhi.
2. **Young Scientist Fellowship(1995-96)** by Tamil Nadu State Council for Science and Technology, Govt. of Tamil Nadu, Chennai, India.
3. **Prof.P.Ramasamy National Award for Crystal Growth (2005)** by Indian Association for Crystal Growth, Anna University, Chennai.
4. **Best Researcher Cash Award (2005-2006)**, Alagappa University, Karaikudi
5. **Visiting Professor (April, 2010-July, 2010)** – Research Institute of Electronics, Shizuoka University, Hamamatsu, Japan.
6. **Visiting Scientist (19-10-2014 to 24-10-2014)** – Hebei Semiconductor Research Institute, Shijiazhuang, China.

Research Achievements:

- ❖ One of the key team members in the Growth of India's first bulk unidirectional 2" dia. Indium Phosphide Single Crystal by LEC technique in the year 1991 and grown several 2" dia., 1Kg GaAs and Si bulk single crystals using High Pressure Crystal Puller manufactured by M/S Cambridge Instruments, UK.
- ❖ Introduction of a new etchant to reveal the subsurface damages in the polished GaAs wafers.
- ❖ Designed and fabricated a versatile low pressure Crystal Puller for Oxide materials.
- ❖ Optimization of experimental parameters for the deposition of AlGaAs/GaAs heterostructures for LASER by Low Temperature-LPE using Piston boat configuration.
- ❖ Introduction of novel crystal growth methods namely **Microtube-Czochralski Technique ($\mu T-CZ$)** to grow single crystals without pre-grown seed and **Uniaxially Solution - crystallization Method of Sankaranarayanan and Ramasamy (SR)*** to grow unidirectional crystals at room temperature from solution.
- ❖ A research paper regarding the Microtube-Czochralski Technique ($\mu T-CZ$) was republished as a News Item in the International journal "Current Science" published by Indian Institute of Science, Bangalore, India.

- ❖ Growth of India's first large size, 650mm length and 55mm diameter unidirectional benzophenone crystal using Sankaranaryanan – Ramasamy (SR) Method at room temperature.
- ❖ Designed and fabricated a transparent Vertical Bridgman Growth system especially for organic NLO crystals.
- ❖ Five research papers are listed among *TOP 25* most downloaded articles in the year 2004 - 2006.

****Research Papers Published in International Journals - 142, Major Research Projects Sanctioned by Govt. of India - 11.***

Events organized in leading roles

Number of Seminars / Conferences / Workshops / organized:5

1. National Workshop on Recent Advancements in Materials Science (NWRAMS-08) at Alagappa University, Karaikudi during 7th March 2008.
2. National Workshop on Crystal Growth and Characterization (NWCGC-09) at Alagappa University, Karaikudi during 16th March 2009.
3. First National Workshop on Characterization Techniques at Alagappa University, Karaikudi during March 24 & 26th March, 2012.
4. Second National Workshop on Characterization Techniques at Alagappa University, Karaikudi during 21st -23rd March, 2013.
5. National Seminar on Recent Developments in Frontier areas of Materials Science, Alagappa University, March 23-24, 2016.

Overseas Exposure / Visits

Visited China (1992-93, 2005, 2010 , 2015) and Japan (2011)

Membership in

Professional Bodies

1. Life member in Indian Crystal Growth Association
2. Life member in Indian Physics Association

Editorial Board

1. Editorial Board - Member, Journal "Sadhana"- V.H.N.S.N.College, Virudhunagar
2. Editorial Board – Member, ANJAC Journal, A.N.J.A.College, Sivakasi

Advisory Board

1. Executive Council Member – Indian Association of Crystal Growth

Academic Bodies (such as Board of Studies etc.,)

1. Board of Studies-Member, Dept. of Physics, Alagappa University
2. Board of studies –Member: M.Sc Physics-A.N.J.A.College, Sivakasi
3. Doctor Committee Member, VIT-Vellore, Anna University-Chennai, NIT-Trichy and University of Madras, Chennai.

Others

1. Acted as a Member in Result Awarding Committee, Selection (Teaching) Committee, Research Centre Awarding Committee, Alagappa University, Karaikudi at various occasions.
2. Acted as Purchase Committee Member (External) in DST and BRNS Sponsored Projects at NIT, Trichy and PSR Engineering College, Tirunelveli

Resource persons in various capacities

Number of Invited / Special Lectures delivered: 30

Others

1. Products developed : Crystals for Scintillator and non-linear applications, Crystal Growth Equipment for SR Method of Crystal Growth.
2. No. of PhD Thesis evaluated : 10
3. No. of PhD Public Viva Voce Examination conducted : 10

Recent Publications

Sl. No.	Paper Title / Authors	Name of Journal, Volume No and Page	Year of Publication
1	Effect of substrate on electroplated copper sulphide thin films B. Bharathi, S. Thanikaikarasan • PratapKollu, P. V. Chandrasekar, K. Sankaranarayanan,X. SahayaShajan	J Mater Sci: Mater Electron (2014) December 2014, Volume 25, Issue 12 , pp 5338-5344 (IF:1.569) DOI 10.1007/s10854-014-2310-7	2015
2	Quantum mechanical study and spectroscopic (FT-IR, FT-Raman, 13C, 1H) study, first order hyperpolarizability, NBO analysis, HOMO and LUMO analysis of 2-acetoxybenzoic acid by density functional methods	SpectrochimicaActa Part A: Molecular and Biomolecular Spectroscopy <i>Volume 136, Part C, 5 February 2015, Pages 1260-1268(IF:2.353)</i> DOI: 10.1016/j.saa.2014.10.012	2015

	K. Bhavani, K.Sankaranarayanan, S. Muthu		
3	Influence of nano sized TiO ₂ on the Structural, Electrical and Morphological Properties of Polymer Blend Electrolytes PEO – PVC – LiClO ₄ S. Jayanthi, K. Kulasekarapandian, A. Arulsankar, K.Sankaranarayanan and B. Sundaresan	Journal of Composite Materials, April 2015; vol. 49, 9:pp. 1035-1045 (IF:1.173) doi:10.1177/0021998314528824	2015
4	In-situ observation of faceted growth of benzophenone single crystals V. Natarajan, M. Arivanandhan, P. Anandan, K. Sankaranarayanan, G. Ravi, Y. Inatomi, Y. Hayakawa	Materials Chemistry and Physics, V144, 3, 2014, 402 - 408 (IF:2.234)	2014
5	Green synthesis of gold nanoparticles from leaf extract of Terminalia arjuna, for the enhanced mitotic cell division and pollen germination activity K. Gopinath, K.S. Venkatesh, R. Ilangovan, K. Sankaranarayanan and A. Arumugam	Industrial Crops and Products, V50 (2013) 737-742. (IF-2.468)	2013
6	"Effect of EDTA concentration on the physical and optical properties of CdS thin films" T.Prem Kumar and K.Sankaranarayanan	The Canadian Journal of Chemical Engineering., V91, p27, 2013 IF:1.003	2013
7	Influence of substrates on the structural, surface, optical, photoluminescence and computed three dimensional nanocrystal shape of CBD-CdS thin films" T.Prem Kumar and K.Sankaranarayanan	"J of Computation and Theoretical Nanoscience" V9, 947–952 (2012) (IF 0.86).	2012
8	Anisotropy of hardness and laser damage threshold of unidirectional organic NLO crystal in relation to the internal structure V. Natarajana, M. Arivanandhanb,, K. Sankaranarayanan, Y. Hayakawab	Materials Chemistry and Physics (IF-2.234) V130, Issues 1–2, 17 October 2011, Pages 154-158.	2011
9	Crystal growth of InGaSb alloy semiconductor at International space station: Preliminary experiments Mukannan Arivanandhan, Govindasamy Rajesh, Tadanobu Koyama, Yoshimi	J. Jpn. Soc. Microgravity Application, V28, 2, 2011, p046 (IF:NA)	2011

	Momose, KrishnasamySankaranarayanan, Akira Tanaka, Yasuhiro Hayakawa,Tetsuo Ozawa, Yasunori Okano and Yuko Inatomi		
10	Effect of pure and mixed solvents on the solubility, crystal growth and morphology of ethyl p-dimethylamino benzoate (EDMAB): An organic nonlinear optical material V. Natarajan, M. Arivanandhan, K. Sankaranarayanan, Y. Hayakawa	Physica B: Condensed Matter, Volume 406, Issue 8, 1 April 2011, Pages 1410-1414, IF:1.327	2011
11	“Crystal Growth and characterization of a new organic material: Ethyl P- dimethylamino benzoate (EDMAB)” V.Natarajan, J. Kalyana sundar, P. Selvarajan, M. Arivanandhan, K. Sankaranarayanan, S.Natarajan, Y. Hayakawa,	J. of Minerals & Materials Characterization and Engineering (IF:NA) Vol. 10, No.1, pp.1-11, 2011	2011