INDIAN ASSOCIATION FOR CRYSTAL GROWTH

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In this Issue

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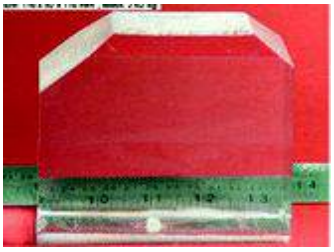
Rapid growth of thin and flexible organic semiconductor single crystal Anthracene by solution growth technique for device fabrication

RECENTLY GROWN TECHNOLOGICALLY IMPORTANT SINGLE CRYSTALS

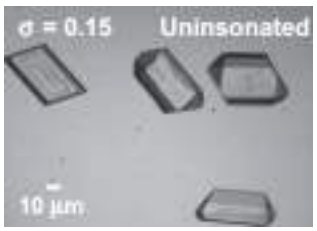
$LiInSe_2$-Prof. P. Ramasamy
CCG, SSNCE

Bismuth Silicon Oxide-
Dr.G.Bhagavannarayana



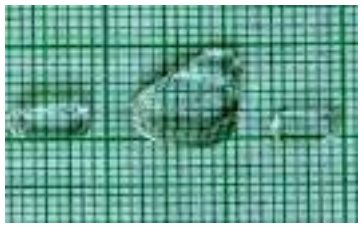
KDP - Dr. S.K. Sharma
LMDDD, RRCAT, Indore

LAPP crystal grown by SR method
Dr.Muthu Senthil Pandian et. al. SSN RC



α-polymorph-Dr.K.Srinivasan
Bharathiyar University

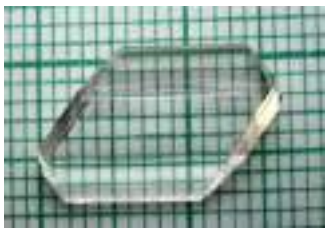
4-ABP - Dr. R. Ramesh Babu
Bharathidasan University



NCS - Dr. R. Gopalakrishnan
Anna University, Chennai

Sodium Borate-Dr.Binay Kumar
University of Delhi

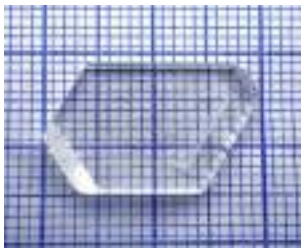
Bismuth Selenide- Dr.N.Vijayan
NPL, New Delhi



HLT- Dr. S. Brahadeeswaran
BIT-Anna University, Trichy

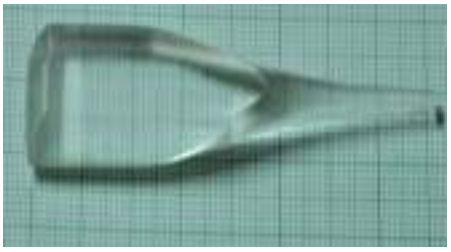
$GdFeO_3$-Dr. S. Kalainathan, Centre for
Crystal Growth, VIT University

$LiSO_4$-Dr. P. Rajesh
et. al. CCG, SSNCE



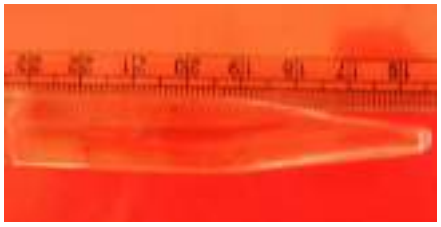
ACHBS - Dr. R. Mohan
Kumar, Presidency College

$Li_2B_4O_7$ - Dr. S. C. Gadkari
BARC, Mumbai



LAPP by SR method - Dr. B. Riscob
et.al, NPL, New Delhi & IPR, Gujarat

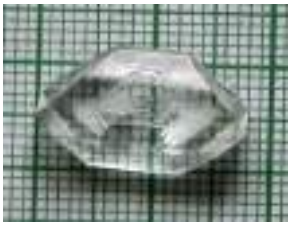
APP-Dr. S.P. Meenakshi
-sundaram, Annamalai Univ



SR grown LTA-Dr. S. Jerome Das
Loyola College

TGS-Dr.S.M.Dharmaprakash
Mangalore University

Doped ADP-Dr. R. Arun Kumar
PSG College of Technology

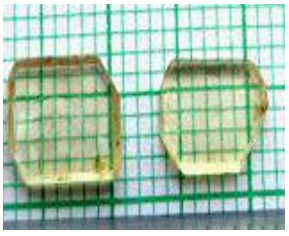


LAHC-Dr. P. Selvarajan
Aditanar Arts College

GUHT-Dr.P.Murugakoothan
Pachaiyappa's College, Chennai

L-LN-Dr.Tanusree Kar
IACS, Kolkatta

L-Cysteine HCl-
Dr.R.K.Ramachandra, AP



NAT - Dr. A. Chandramohan
SRMV College

mNA- Dr. J. Madhavan
Loyola College

Editorial Message

It is a great pleasure for me to present you the TWENTY SEVENTH issue of IACG NEWS LETTER-2015. An enthusiastic note is that the number of the IACG members is increasing tremendously. To date we have about 350 Crystal Growth research active life members. The immense support and encouragement we have been receiving from the Indian Crystal Growth Community has given us enthusiasm to bring out the Twenty Seventh Issue of our IACG News Letter. This newsletter makes aware of achievements and the new developments achieved by the Crystal Growth community in India. The objectives of the association are to promote, encourage and develop the theory and practice of growth of Crystals, to organize Conferences, Seminars, Workshops etc., in various parts of the country, to educate the people at different levels and offer a proper platform for reporting and discussing new developments in the field of Crystal Growth.

We have successfully organized EIGHTEENTH Crystal Growth seminars, many of them with International Participation. The XVIII NSCG-2014 provided a platform for the research community in Crystal Growth and characterizations to meet, discuss and share the latest advances in these fields. Three days of togetherness has developed a strong and healthy support between the experts in the field of Crystal Growth. Many novel and innovative ideas to reform the field of Crystal Growth and its applications and related areas, were evolved through the discussions and sharing between the distinguished professors and renowned scientists from the different parts of the country. Interaction with the eminent personalities has been a great motivation to the research scholars and post graduate students who participated in the conference. Discussions on student exchange programme with reputed institutions were initiated.

The present "XIX National Seminar on Crystal Growth-2015" is a major event for us involving several Senior and Young Scientists. More than 200 abstracts have been selected from many National Laboratories, Universities and Research Institutes for Contributed Papers. We have more than 30 Invited Lectures from well established Crystal Growth Laboratories. The lectures cover wide spectrum of Crystal Growth and Characterization of advanced materials: Theoretical aspects, Kinetics of Crystal Growth, Modeling and Simulation, Experimental aspects of Crystal Growth, Solution Growth, Sankaranarayanan-Ramasamy (SR) method, Melt Growth, Novel Materials, Industrial Crystallization, Crystal Characterizations, Semiconductor, Optoelectronic Crystals and Crystal Devices.

For a long time now the focus in our country has been towards industrial growth. The understanding of crystal growth processes and associated phenomena is being applied increasingly in the study of scientific areas far removed from any intention to grow crystals as specific aim. It is important that enough expertise is created in the country to grow large size good quality crystals leading to economic prosperity in the country. Availability of high quality crystals is equal to the ability to raise the country's economy. Many of us have been reasonably successful in our Crystal Growth efforts. However we have not been able to sustain the focus of our activity for a long time. We submit projects for funding and whenever we are successful in getting the projects we grow the crystals relevant to the project. There are some laboratories in different parts of the world which continue to grow one and the same crystals for decades thus working for improving for crystal perfection as well as crystal size. One example for the laboratory is InP growth activities in *Prof.Niefeng Sun's laboratory*, *National Key lab of ASIC, Semiconductor Research Institute, China*. InP has been grown in that laboratory for nearly 50 years. The expertise built in such situations in uncomparable. Maybe some of us can plan to grow crystals with a focus on important areas like Energy.

In our country there are several research groups growing crystals who want to study SHG properties of their crystals. However there is no one "laboratory of easy access" wherein this work is undertaken. Many of us grow the crystals for nonlinear optical (NLO) applications and we measure the SHG efficiency for Kurtz-Perry technique. It will be desirable if we can think of establishing the facility for measuring SHG for crystals in one or two crystal growth laboratories in the country.

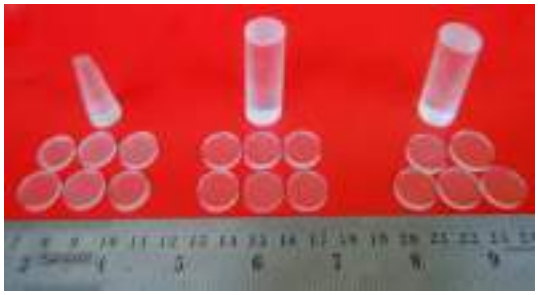
Every effort has been made to bring to you the most of the news in a brief manner.

Dr. Muthu Senthil Pandian
Editor, Indian Association for Crystal Growth-News Letter, Issue-27

Sankaranarayanan - Ramasamy (SR) Method of Crystal Growth

Growth of TGS crystal at Phase Transition temperature along polar b-axis by SR method

V. Sivasubramani, Muthu Senthil Pandian*, P. Ramasamy
SSN Research Centre, SSN College of Engineering, Chennai-603 110, Tamilnadu



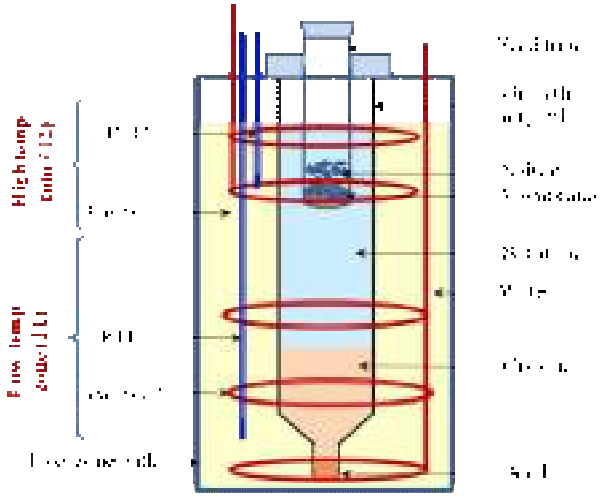
Triglycine sulfate (TGS) is known as an important ferroelectric crystal for IR detector applications. TGS is order-disorder type ferroelectrics with a transition from ferroelectric to paraelectric phase at 49°C. Crystal growth of TGS in ferroelectric (below T_c) and paraelectric (above T_c) was done in **Dr.Sunil Verma's** lab, LMDDD, RRCAT, Indore, MP. TGS single crystal of diameter 20 mm and length 200 mm was grown successfully at T_c (49°C) first time in SSN RC. The total growth period was 90 days. The systematic investigations have been carried out.

Reference:
1.Muthu Senthil Pandian, P. Ramasamy, Binay Kumar, Materials Research Bulletin, *47 (2012) 1587-1597.*

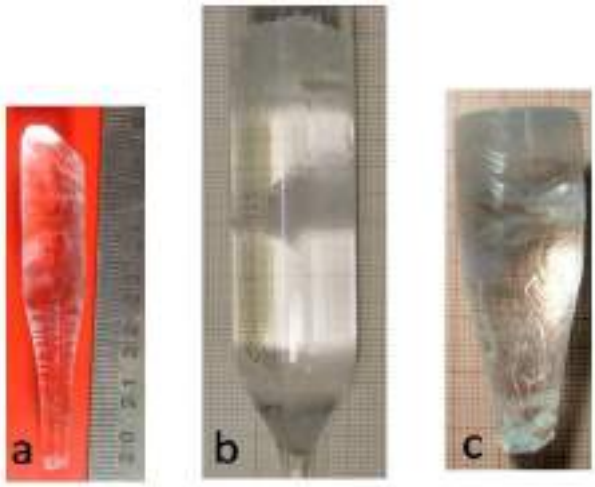
Development of online solute feeding based unidirectional growth technique

S. K. Sharma, Sunil Verma, Yeshpal Singh, K. S. Bartwal, P. K. Gupta
Laser Materials Development & Devices Division,
Raja Ramanna Centre for Advanced Technology (RRCAT), Indore-452 013, Madhya Pradesh

Shape modification of solution grown crystals is technologically important to enhance usable volume fraction for device applications. Recently unidirectional growth technique, also known as "SR technique", developed by Ramasamy and co-workers has been used to grow several important crystals. The technique is based on solvent evaporation and hence require special care to overcome spurious nucleation. We have developed a new methodology [1] to grow crystals using basic approach of the above method but introducing the concept of continuous solute feeding during growth which helps in rapid growth, maintaining the supersaturation levels and in overcoming the problem of spurious nucleation. The schematic of the setup is shown in Fig. 1. The technique has been applied for fast growth of KDP along [100] and [101] directions from point seeds. To applicability of the technique was further verified for growth of LAP crystal.



Schematic of the solute feed based Unidirectional growth technique



Unidirectional grown crystals by solute feeding technique (a) KDP along [001] direction, (b) KDP along [101] direction and (c) LAP along [010] direction

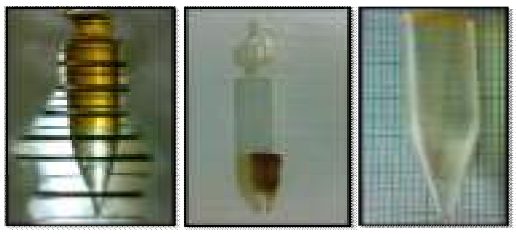
Reference:
1. S. K. Sharma, Yeshpal Singh, Sunil Verma, K. S. Bartwal, P. K. Gupta, *"Rapid growth of KDP and LAP crystals by solute feeding during unidirectional growth"* National Laser Symposium-22, January 8-11, 2014, Manipal University, pp.62.

Novel work done in Crystal Growth

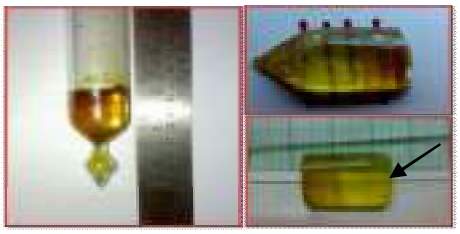
Design and fabrication of Vertical Dynamic Gradient Freeze setup: A versatile setup for organic single crystal growth

Vertical dynamic gradient freeze system for the growth of organic single crystals was designed and constructed. The function and operation of major constituents of the designed system such as eight zone furnace, PLC based temperature controller, microstepping translation assembly, and CCD video camera. Single crystals of Benzimidazole, 4-aminobenzophenone and phenothiazine were grown to demonstrate the potential application of the designed system. The grown crystals are good structural and optical quality. Multizone, ease of programming the thermal profile and *in situ* observation of thermal profile, growth, and growth history have made the designed system as the versatile one for the growth of organic single crystals.

Dr. R. Ramesh Babu, Assistant Professor, Crystal Growth & Thin Film Laboratory, Department of Physics, Bharathidasan University, Trichy-620 024, Tamilnadu



Photos of 8-HQ single crystal growth from VBT (a) during growth (b) crystal with ampoule (c) harvested crystal



Photos of 4-ABP single crystals grown from VBT (a) Crystal with ampoule (b) harvested crystal (c) cut & polished crystal

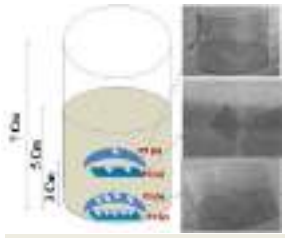
Photograph of the designed Vertical dynamic gradient freeze system

Rapid growth of thin and flexible organic semiconductor single crystal Anthracene by solution growth technique

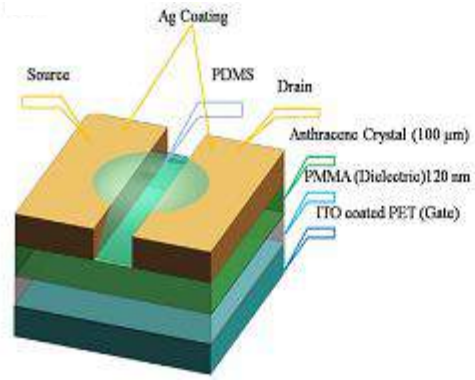
Growth of thin and flexible organic semiconductor crystal Anthracene (AN) has been achieved in a very short duration. This simple, yet an effective approach was serendipitously found to yield high quality crystal with typical dimensions of 22×23×0.15-0.50 mm^3 within a duration of about 30 min whereas a conventional method could take about 7-10 days to achieve similar dimensions. Further, these crystals were seen swirling and settling down slowly at the bottom of the growth flask. These factors were favorably utilized to place the Anthracene crystals firmly on prefabricated flexible substrates when they were kept in different heights within the solutions. This systematic approach also facilitated the fabrication of organic field effect transistor (OFET) and the results obtained were encouraging.

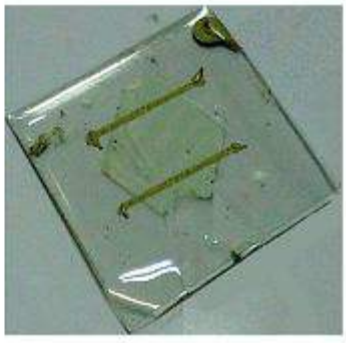
As grown AN single crystal

Dr. S. Brahadeeswaran, Professor & Head, Crystal Research Laboratory, Department of Physics, BIT Campus, Anna University, Trichy-620 024, Tamilnadu



AN single crystal deposition on flexible substrate at different stage





Schematic representation of AN based OFET and OFET device fabricated AN single crystal

Reference:

1. K. Tirupugalmani, G. Shanmugam, V. Kannan, S. Brahadeeswaran, Journal of Crystal Growth, 413 (2015) 67-70.

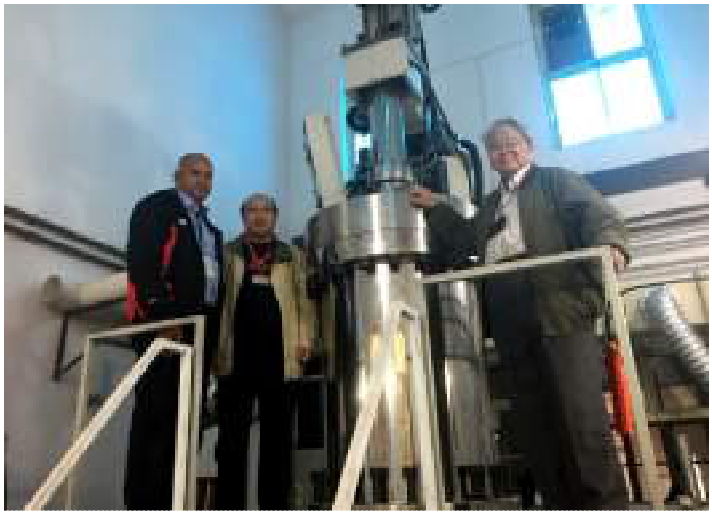
International Conference / Laboratory Visit

Prof.S.Kalainathan, VIT University visited to Prof.Fumio Hamada's lab at National Corporative University, Akita University, Japan during ***October-2014***. The labs in Akita University are specialized fully with instruments of state of the art. He was growing various organic single crystals by solution growth techniques. The grown single crystals were characterized by SXRD, FTIR, TG-DTA, SEM and homo-lumo studies in order to study the electron excitations within the grown crystals. Various organic and inorganic single crystals grown by his research scholars at VIT University were characterized at various laboratories in ***Akita University, JAPAN***.

Dr.R.Ezhil Vizhi with Prof.Jochen Friedrich

Dr.R.Ezhil Vizhi, VIT University presented three papers in the ***EMRS spring meeting-2014*** held at Grand Palias, Lille, France during ***26-30th May 2014***. The conference includes 30 parallel symposia and one plenary session representing the latest in materials for advanced technologies. Approximately 2,500 scientists and researchers from various countries gathered here to discuss the latest developments in materials science. Out of three papers presented in the symposium, two of them were published in the reputed journal-*Crystal Research and Technology (CRT)*.

Dr. A. T. Ravichandran, Associate Professor, PG & Research Department of Physics, National College, Tiruchirappalli, participated in the ***International Conference on Biotechnology and Bioengineering (ICBB2014)*** organized by ***BITS Pilani Dubai campus, Dubai, UAE*** during ***29-30 October 2014***. He presented a paper entitled ***"Technologically important single crystals and its various applications"*** and he also chaired a session on the first day of the conference. More than 80 participants from India and more than 200 participants from other countries took active participation.



Prof. K. Sankaranarayanan with Prof. Niefeng Sun and Prof. Tongnian Sun

Prof. K. Sankaranarayanan, Department of Physics, Alagappa University, Karaikudi has visited InP Laboratory, Hebei Semiconductor Research Institute and delivered special lectures on ***"Unidirectional crystal growth from melt and solution"*** during ***October 18-26, 2014***. He had scientific discussion with Prof.Tongnian Sun, Senior Scientist and Prof.Niefeng Sun, Head-InP Group and participated InP Synthesis and crystal growth using newly established largest InP synthesiser cum puller which is capable of synthesising 16 kg poly InP and growing 6" InP single crystal.

Dr. S. Stephen Rajkumar Inbanathan with Dr. Michel Fleck, Editor, Journal of Crystal Growth

Dr. S. Stephen Rajkumar Inbanathan, Assistant Professor, Department of Physics, The American College, Madurai has visited Dr. Michel Fleck at Institute for Mineralogy and Crystallography, Faculty of Geo science Geography and Astronomy, University of Vienna, Austria during the Month of ***May 2014***. The visit was very useful in terms further collaborative research and some technical discussion in solving crystal structures of certain compounds of mutual interest. The state of the art facility there is excellent.

Crystal Growth Seminars organized by
INDIAN ASSOCIATION FOR CRYSTAL GROWTH (IACG)

No	Name of the Programme	Place	Period
1.	**1st** National Seminar on Crystal Growth **(NSCG-1982)**	Crystal Growth Centre Anna University, Chennai-600 025	4-6 October **1982**
2.	**2nd** National Seminar on Crystal Growth **(II NSCG-1983)**	Crystal Growth Centre Anna University, Chennai-600 025	27-30 August **1983**
3.	**3rd** National Seminar on Crystal growth **(III NSCG-1987)**	Crystal Growth Centre Anna University, Chennai-600 025	16-19 February **1987**
4.	**4th** National Seminar on Crystal Growth **(IV NSCG-1989)**	University of Mysore Mysore, Karnataka-570 005	3-6 August **1989**
5.	**5th** National Seminar on Crystal Growth **(V NSCG-1993)**	Crystal Growth Centre Anna University, Chennai-600 025	18-20 November **1993**
6.	**6th** National Seminar on Crystal Growth **(VI NSCG-1995)**	Crystal Growth Centre Anna University, Chennai-600 025	12-15 February **1995**
7.	**7th** National Seminar on Crystal Growth **(VII NSCG-1997)**	Crystal Growth Centre Anna University, Chennai-600 025	6-8 January **1997**
8.	**8th** National Seminar on Crystal Growth **(VIII NSCG-1999)**	Crystal Growth Centre Anna University, Chennai-600 025	3-5 February **1999**
9.	**9th** National Seminar on Crystal Growth **(IX NSCG-2003)**	Crystal Growth Centre Anna University, Chennai-600 025	24-26 February **2003**
10.	**10th** National Seminar on Crystal Growth **(X NSCG-2005)**	Department of Physics Kongu Engineering College Erode-638 052	27-29 January **2005**
11.	**11th** National Seminar on Crystal Growth **(XI NSCG-2006)**	Centre for Crystal Growth SSN CE, Chennai-603 110	7-9 December **2006**
12.	**12th** National Seminar on Crystal Growth **(XII NSCG-2007)**	Centre for Crystal Growth SSN CE, Chennai-603 110	21-23 December **2007**
13.	**13th** National Seminar on Crystal Growth **(XIII NSCG-2009)**	Centre for Crystal Growth SSN CE, Chennai-603 110	27-29 January **2009**
14.	**14th** National Seminar on Crystal Growth **(XIV NSCG-2010)**	Centre for Crystal Growth VIT University, Vellore-632 014	10-12 March **2010**
15.	**15th** National Seminar on Crystal Growth **(XV NSCG-2011)**	PSN College of Engineering Tirunelveli-627 152	23-25 February **2011**
16.	**16th** National Seminar on Crystal Growth **(XVI NSCG-2012)**	Department of Physics Aditanar College of Arts & Science Tiruchendur-628 216	19-21 January **2012**
17.	**17th** National Seminar on Crystal Growth **(XVII NSCG-2013)**	Department of Physics Anna University, Chennai-600 025	9-11 January **2013**
18.	**18th** National Seminar on Crystal Growth **(XVIII NSCG-2014)**	Centre for Crystal Growth SSN CE, Chennai-603 110	24-26 February **2014**
19.	**19th** National Seminar on Crystal Growth **(XIX NSCG-2015)**	Centre for Crystal Growth VIT University, Vellore-632 014	12-14 March **2015**

YOUNG/SENIOR RESEARCHERS FORUM

PATENT FILED

Inventors: **Dr. R. Arun Kumar**
**GRD Centre for Materials Research, PSG College of Technology, Coimbatore-641 004, TN*
Dr. Y. Hayakawa
**Research Institute of Electronic, Shizuoka University, Hamamatsu, Japan*
Dr. M. Arivanandhan
**Centre for Nanoscience, Anna University, Chennai-25,TN*

Title: **Optical Materials and Fabrication Method of Optical Materials**
Japanese Patent Number: **JP patent P2014-033362A**

BEST INNOVATIVE RESEARCHER AWARD

Dr. Muthu Senthil Pandian, Research Scientist, SSN Research Centre, SSN College of Engineering, Chennai-603 110, Tamilnadu has received ***Best Innovative Researcher Award*** for his Outstanding Contributions in the field of Crystal Growth from ICBDM-2014 during 28th February 2014. This award was given by IEEE & Indian Society for Technical Education (ISTE), New Delhi.

BHARAT EXCELLENCE AWARD

Dr. N. Vijayan, Senior Scientist, Crystal Growth and X-ray Analysis Section, NPL, New Delhi has received "***Bharat Excellence Award"*** from Shri Randhir Singh Hon'ble Former Governor of Sikkim: Awarded by Friendship Forum of India during September 2014.

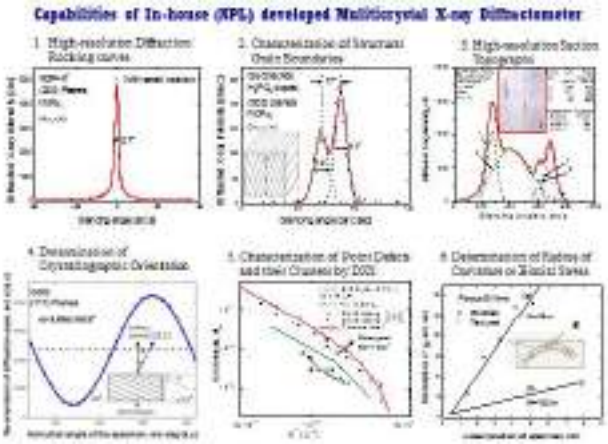
BEST RESEARCHER AWARD

Dr. R.K. Balachandar, C/O Prof. S. Kalainathan, Centre for Crystal Growth, VIT University, Vellore has received ***Best Researcher Award-2014*** for highest number of publications in Crystal Growth from University Day function during 30th April 2014.

K.Boopathi, C/o Prof.P.Ramasamy, SSNCE & **K.Senthil,** C/o Prof.S.Kalainathan, VIT Univ., received the **BEST POSTER AWARD** in Crystal Growth from 59th DAE Solid State Physics Symposium (SSPS-2014), held at VIT University Vellore during 16-20, December 2014.

Dr.P.Selvarajan, Associate Professor, Department of Physics, Aditanar College of Arts and Science, Tiruchendur received the "***Outstanding Reviewer Award"*** from Materials Research Bulletin Journal on December-2014.

HIGH RESOLUTION MULTICRYSTAL X-RAY DIFFRACTOMETER (HRXRD) designed, developed and fabricated at CSIR- NPL - Dr. G. Bhagavannarayana



Description: State-of-the-art in-house developed Multicrystal X-ray Diffractometer with three (111) Si monochromators having two Bonse-Hart crystals (+,–) and a third crystal in dispersive configuration (+,–,–) leading to a highly monochromatic and parallel $K\alpha_1$ exploring beam (originated from a fine focus X-ray source) with very low wave length spread ($\Delta\lambda/\lambda<10^{-5}$) and very less horizontal divergence (« 3 arc sec). The specimen stage lies in the (+,–,–,+) configuration.

Capabilities: Point defects and their aggregates in nearly perfect crystals disturb atoms/ions around them in the lattice leading to diffuse X-ray scattering (DXS) through which, with the above diffractometer, one can characterize point defects and their clusters regarding nature, size and shape. Also diffraction curves with half widths close to theoretically expected limits [a few (say 2.7) arc sec] can be recorded. Device quality crystals grown by different methods, defect structure produced by different heat treatments, poling, reduction, oxidation, ion implantations etc. can be characterized. Structural boundaries including the very low angle boundaries (tilt angle < 1 arc min) with section topographs can be characterized. Defect structure in epitaxial films and their interfaces with the substrate crystals can be quantitatively determined. Lattice mismatch ($\Delta d/d$), composition, relaxation, thickness of theepitaxial films or their devices can be determined. Crystallographicorientation of surfaces of single crystals can be determined with an unprecedented accuracy of $\pm$ 6 arc sec. Curvature of even nearly parallel (up to a few km radius) crystallographic planes of single crystals or stress developed due to thin/porous films deposited/ formed on substrates can be measured. Crystals with sizes ranging from a few cubic mm to several cubic inches can be characterized.

Reference: Krishan Lal and G. Bhagavannarayana, J. Appl. Cryst. 22, 209-215 (1989). ***Citations: > 300.***

It has been serving most of the crystal growers in India leading to enrichment of many SCI papers and in-house/ funded projects like CSIR, DST, BRNS, UGC etc.

X'Calibur Oxford Diffraction Make (U.K)

Prof. Rajni Kant
Department of Physics
University of Jammu
Jammu, Tawi-180 006
Coordinator DST-XRD
National Facility
E-Mail: rkant.ju@gmail.com
Mobile:+91-9419194375
Telephone: +91-191 2432051

The X-ray Crystallography Research Group at Physics Department, University of Jammu has been running a DST-sponsored Single Crystal X-ray Diffractometer with CCD Camera as a National Facility since 2007. Shortly we are going to include a Cryojet attachment with this facility to carry out Low-to-Room temperature data analysis. This facility is being used by over 22 universities/institutions and is extended free of any charge. Researchers working in this field can make use of this facility.

BEST PAPER AWARDS

BEST POSTER PRESENTATION AWARD Winners in the *XVIII National Seminar on Crystal Growth (XVIII NSCG-2014)* held at Centre for Crystal Growth, SSN College of Engineering, Chennai, 24-26 February 2014

BEST CRYSTAL DISPLAY AWARD Winners in the *XVIII National Seminar on Crystal Growth (XVIII NSCG-2014)* held at Centre for Crystal Growth, SSN College of Engineering, Chennai, 24-26 February 2014

P. Nagapandi Selvi, Anna University, Chennai received **BEST ORAL PRESENTATION AWARD** in the National Seminar on Recent Advances in Material Science (RAMS-2014) held at Bharathidasan University, 3-4 February 2014

R.G. Abhilash Kumar, University College, Thiruvananthapuram received **BEST ORAL PRESENTATION AWARD** in the National Seminar on Recent Advances in Material Science (RAMS-2014) held at Bharathidasan University, 3-4 February 2014

S. Mathuri, SRM University, Kattankulathur received **BEST ORAL PRESENTATION AWARD** in the National Seminar on Recent Advances in Material Science (RAMS-2014) held at Bharathidasan University, 3-4 February 2014

J. Martin Sam Gnanaraj, The Rajah's College, Pudukkottai received **BEST POSTER PRESENTATION AWARD** in the National Seminar on Recent Advances in Material Science (RAMS-2014) held at Bharathidasan University, 3-4 February 2014

P. Soundarrajan, Madurai Kamaraj University, Madurai received **BEST POSTER PRESENTATION AWARD** in the National Seminar on Recent Advances in Material Science (RAMS-2014) held at Bharathidasan University, 3-4 February 2014

K. Mangaiyarkarasi, National College, Tiruchirappalli received **BEST POSTER PRESENTATION AWARD** in the National Seminar on Recent Advances in Material Science (RAMS-2014) held at Bharathidasan University, 3-4 February 2014

V. Sivasubramani, Centre for Crystal Growth, SSN CE received **BEST ORAL PRESENTATION AWARD** in the NSCGNM-2014 held at Department of Physics, National College, Trichy, 7-9 August 2014

M. Magesh, Centre for Crystal Growth, SSN CE received **BEST ORAL PRESENTATION AWARD** in the NCHSM-2014 held at SRM University, Chennai, 24-25 March 2014

M. Srinivasan, Centre for Crystal Growth, SSN CE received **BEST ORAL PRESENTATION AWARD** in the NCHSM-2014 held at SRM University, Chennai, 24-25 March 2014

V. Harikrishnan, VIT University, Vellore received **BEST POSTER PRESENTATION AWARD** in the ICMAGMA-2014 held at Pondicherry University on 15-17 September 2014

K.S. Venkatesh, received **BEST ORAL PRESENTATION AWARD** in the RTNTA-2014 held at Department of Physics, K.L.N. College of Engineering, Sivagangai on 18-19 September 2014

T. Logu, Madurai Kamaraj University, Madurai received **BEST ORAL PRESENTATION AWARD** in the ATOM-2014 held at Department of Physics, Government College, Rajahmundry, AP on 8-9 December 2014

N. Karunagaran, Centre for Crystal Growth, SSN CE, Chennai received **BEST ORAL PRESENTATION AWARD** in the ATOM-2014 held at Department of Physics, Government College, Rajahmundry, AP on 8-9 December 2014

Researchers from Crystal Growth & Nanoscience Research Centre, Department of Physics, Government College, Rajahmundry, AP received **BEST POSTER PRESENTATION AWARD** in the ATOM-2014 held at on 8-9 December 2014

C. Prema, Sri Paramakalyani College, Alwarkurichi received **BEST POSTER PRESENTATION AWARD** in the NCRTAP-2015 held at PG Department of Physics, The M.D.T. Hindu College, Tirunelveli on 19-20 February 2015

M. Sheeba, St. Mary's College, Thoothukudi received **BEST ORAL PRESENTATION AWARD** in the NCRTAP-2015 held at PG Department of Physics, The M.D.T. Hindu College, Tirunelveli on 19-20 February 2015

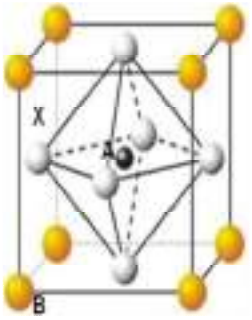
M. Krishnasamy, S.T. Hindu College, Nagercoil received **BEST ORAL PRESENTATION AWARD** in the NCRTAP-2015 held at PG Department of Physics, The M.D.T. Hindu College, Tirunelveli on 19-20 February 2015

D. Shanthi, Aditanar College of Arts & Science, Tiruchendur received **BEST POSTER PRESENTATION AWARD** in the NCRTAP-2015 held at PG Department of Physics, The M.D.T. Hindu College, Tirunelveli on 19-20 February 2015

Development of TL/OSL dosimeter at IGCAR Kalpakkam for Radiation dosimetry applications in collaboration with SSN Research Centre, SSN Institutions

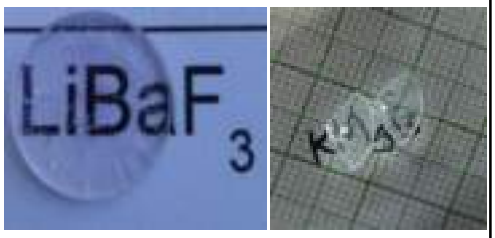
Dr. U. Madhusoodanan

Radiological Safety Division
Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam-603 102, Tamilnadu



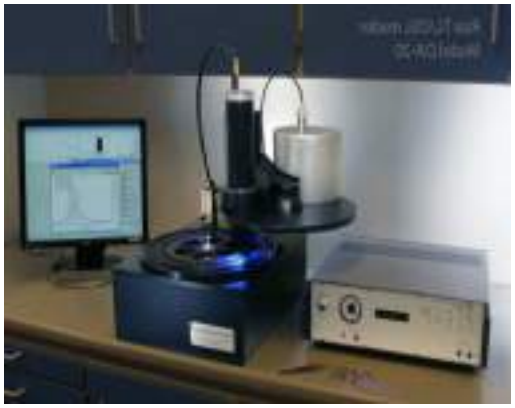
Schematic perovskite crystal structure

Bridgman-Stockbarger Experimental setup



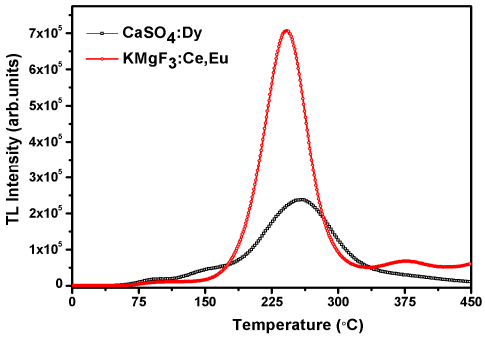
Cut and polished Fluoride crystals

Crystals with perovskite structure have extensive practical applications and are convenient models for investigating the optical properties of rare earth metal impurity ions [1-3]. The perovskite structure has the general stoichiometry ABX_3, where 'A' and 'B' are cations and 'X' is an anion. The ideal cubic perovskite structure shown in Figure. Our investigation mainly focused on fluoride based crystals with perovskite structure such as $KMgF_3$, $NaMgF_3$ and $LiBaF_3$.



RisØ TL/OSL-DA-20 *system for TL/OSL characterization of single crystals at RSD, IGCAR, Kalpakkam.*

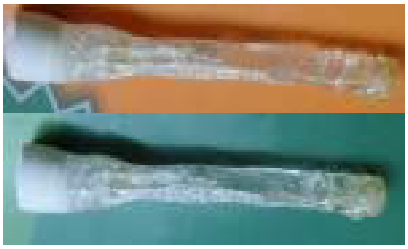
Dr. U. Madhusoodanan
Scientific Officer-E
Radiological Safety Division,
IGCAR, Kalpakkam-603 102
Email: ums@igcar.gov.in



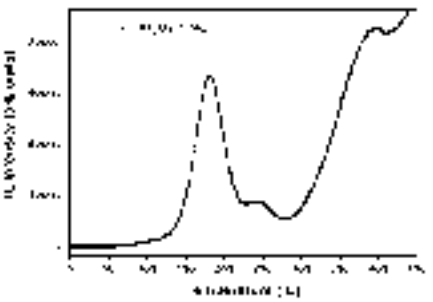
Inter comparison between $KMgF_3$ and standard $CaSO_4$:Dy

The thermoluminescence intensity inter comparison analysis clearly revealed that the $KMgF_3$ sample has three times higher intensity than the standard $CaSO_4$:Dy TL dosimeter material which is currently used in India.

Mr. D. Joseph Daniel has worked as a JRF in IGCAR-project entitled **"Development and characterization of mixed alkali halide single crystals for dosimetry applications in IGCAR"** with guidance of Prof. P. Ramasamy and Dr. U. Madhusoodanan.



Al_2O_3 crystals grown by Float-Zone technique with collaboration of ***Dr. S. Ganesamoorthy****, at UGC-DAE, Kalpakkam node.*



TL glow curve of Al_2O_3:C,Mg

References:

[1] Janson et al. J. Phys: Conden. Matt. **5** (1993) 1589-96.
[2] N.Shiran et al. J. Lumin. **87** (2000) 561-63.
[3] A.V. Gektin et. al. Radiat. Meas. **72** (1997) 664-66.

Quantifying metallic impurity distribution in flat-top KDP crystal using X-ray fluorescence beam-line of INDUS-2 synchrotron radiation source

Sunil Verma*, S.K. Sharma, Yeshpal Singh, K.S. Bartwal, M.K. Tiwari, G.S. Lodha & P.K. Gupta

Raja Ramanna Centre for Advanced Technology (RRCAT), Indore-452 013, Madhya Pradesh

X-ray fluorescence beam-line (BL-16) of INDUS-2 synchrotron radiation source at RRCAT Indore was used for determination of metallic impurity distribution in a flat-top shaped KDP crystal of size 90×82×93 mm^3. The aim of the studies was to find the relative distribution of Fe impurity in the prismatic and the pyramidal growth sectors. The results show that pyramidal growth sector has lesser Fe impurity as compared to the prismatic growth sector. Additionally, it was found that the top plate had ~ 25% lesser Fe concentration than the bottom plate. Figure.1 (a) shows the authors setting up the sample in the synchrotron beam-line and Figure.1 (b) shows the measured energy-dispersive X-ray fluorescence spectra showing chemical species in (001)-bottom plate of the FT-KDP crystal. The inset shows incident X-ray radiation and fluorescence detection geometry. Figure.2 shows the schematic of the FT-KDP crystal and various plates used for characterization. Table 1 shows the concentration of Fe and Ni impurities in different growth sectors of (100), (010), (001) and (101) plates taken from the FT-KDP crystal.

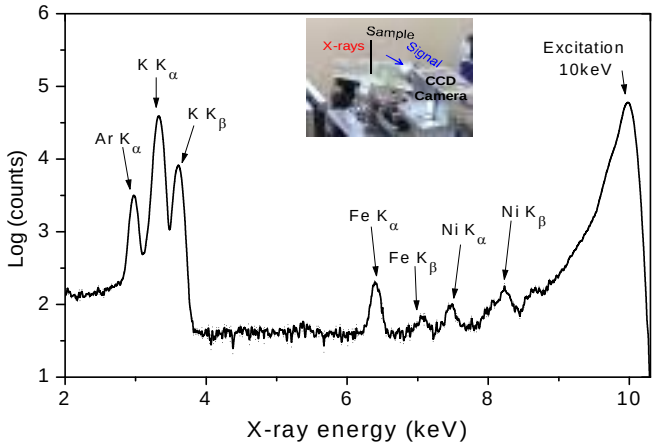


Fig 1. (a) Authors setting up the sample in the XRF beam line at INDUS-2 synchrotron radiation source at RRCAT Indore; (b) The measured energy-dispersive X-ray fluorescence spectra showing chemical species in (001)-bottom plate of the FT-KDP crystal. The inset shows incident X-ray radiation and fluorescence detection geometry.

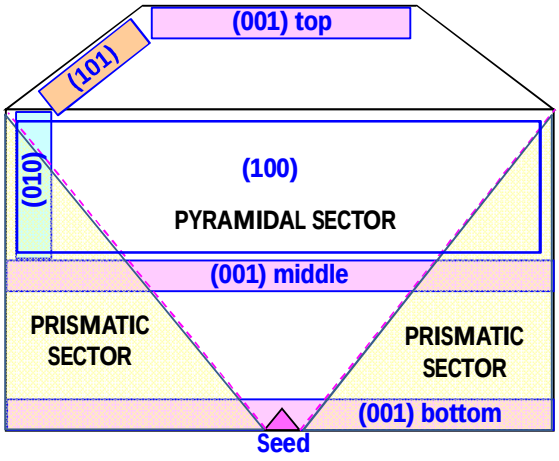


Fig 2. Schematic showing the location of (100), (010), (101), (001)-bottom, (001)-middle and (001)-top plates in the FT-KDP crystal.

Crystal plate	Growth sector	Metallic impurity (ppm ± 10%)	
		Fe	Ni
(001)-bottom	Prismatic	16	3
(001)-middle	Prismatic	12	2
(001)-middle	Pyramidal	6	2
(001)-top	Pyramidal	3	3
(100)	Prismatic	7	2
(010)	Prismatic	6	3
(101)	Pyramidal	4	2

Table 1. Concentration of Fe and Ni impurities in different growth sectors of (100), (010), (001) and (101) plates taken from the FT-KDP crystal.

Ph.D. Theses in Crystal Growth (2014-2015)

No	Name of the Student	Title of the thesis	Supervisor & Affiliation
1	**Anitha Hudson. J**	Studies on II-VI compound added ADP single crystals	**Dr. C. M. Padma** Women's Christian College Nagercoil-629 001
2	**Arun Kumar. A**	Structure, crystal growth and characterization of Morpholinium Perchlorate and Carboxylic Acid based crystals	**Prof. P. Ramasamy** SSN College of Engineering Chennai-603 110
3	**Arumanayagam. T**	Investigation on nonlinear optical Guanidinium based single crystals	**Dr. P. Murugakoothan** Pachiyappa's College Chennai-600 030
4	**Arulmozhi. S**	Structural, spectral and computational studies of nonlinear optical 2A5CB, LPOP, LHDN and LHHF single crystals	**Dr. J. Madhavan** Loyola College Chennai-600 034
5	**Balachandar. R.K**	Synthesis, growth and characterization of Schiff organic nonlinear optical single crystals by slow evaporation technique	**Prof. S. Kalainathan** VIT University Vellore-632 014
6	**Bharath. D**	Synthesis, growth and characterisation of organic Malonodinitrile derivatives nonlinear optical single crystals by slow evaporation technique	**Prof. S. Kalainathan** VIT University Vellore-632 014
7	**Bincy. I.P**	Single crystal growth of new organic compounds and their characterization for third order nonlinear optical applications	**Dr. R. Gopalakrishnan** Anna University Chennai-600 025
8	**Dhanasekaran. P**	Nucleation control and separation of L-glutamic acid polymorphs by swift cooling crystallization process and growth and characterization of single crystals of L-glutamic acid-Halogen derivatives	**Prof. K. Srinivasan** Bharathiyar University Coimbatore-641 046
9	**Dinesh Raja. M**	Theoretical and experimental conformation on structural, vibrational and nonlinear optical properties of amino acid based single crystals	**Dr. J. Madhavan** Loyola College Chennai-600 034
10	**Dilip Maske**	Synthesis and characterization of InSb; Bi bulk semiconductor crystals grown by VDS technique for optoelectronic devices	**Prof. D. B. Gadkari** Mithibai College Mumbai-400 056
11	**Felicita Vimala. L**	Growth, structural and optical studies of organic, amino acid doped semi-organic nonlinear optical single crystals	**Dr. J. Thomas Joseph Prakash** Government Arts College Trichy-621 201
12	**Idamalarselvi. R**	Spectral and Phyico-chemical behavior studies of molecular interactions in a certain organic liquid systems	**Dr. C. Ramachandra Raja** Government Arts College Kumbakonam-612 001
13	**Jencylin Navarani.D**	Studies on characterization of some NLO based undoped and doped single crystals grown by solution method	**Dr. P. Selvarajan** Aditanar College of Arts and Science, Tiruchendur-628 216
14	**Jegan Mohan Dass. P. N.**	Influence of La^{3+} and Nd^{3+} on structural and optical properties of organic NLO single crystals	**Dr. J. Madhavan** Loyola College Chennai-600 034
15	**John David Ebenezar. I**	Experimental and theoretical studies on some organic nonlinear optical crystals	**Dr. C. Ramachandra Raja** Government Arts College Kumbakonam-612 001
16	**Joy Sinthiya. A.S.I.**	Investigations on nucleation kinetics, growth and studies of some L-asparagine based NLO crystals	**Dr. P. Selvarajan** Aditanar College of Arts and Science, Tiruchendur-628 216

17	**Kamini Kapoor**	Single crystal growth, X-ray structure and hydrogen bonding analysis of some bioactive organic molecules	**Prof. Rajin Kant** University of Jammu Jammu Tawai-06
18	**Kirubagaran. R**	Investigations on structural and optical properties of amino acid based nonlinear optical perchlorate single crystals	**Dr. J. Madhavan** Loyola College Chennai-600 034
19	**Karunanithi. U**	Synthesis, growth and characterization of pure and doped nonlinear optical LPM, LAM, LArM and LAO single crystals	**Dr. J. Madhavan** Loyola College Chennai-600 034
20	**Kannan. V**	Synthesis, crystal growth and characterization of hydrazonium L-tartarate and certain pyridine based organic nonlinear optical materials	**Dr. S. Brahadeeswaran** Anna University Trichy-620 024
21	**Kanagathara. N**	Spectroscopic, dielectric and thermal characterization of bis(4-nitrophenol) 2,4,6-triamino 1,3,5-triazine monohydrate, melamine family single crystals	**Dr. G. Anbalagan** Presidency College Chennai-600 005
22	**Kavitha. J. M**	Growth and characterization of some metal sulphate heptahydrate single crystals	**Prof. C. K. Mahadevan** S.T. Hindu College Nagercoil-629 001
23	**Krishna Kumar. M**	Investigations of the growth and characterization of stilbazolium derivative nonlinear optical single crystals	**Dr. R. Mohan Kumar** Presidency College Chennai-600 005
24	**Lakshmipriya. M**	Investigation on the nucleation kinetic, growth and characterization of KB_5, NaB_4, lithium succinate and KHP single crystals for frequency conversion applications	**Dr. R. Ezhil Vizhi** VIT University Vellore-632 014
25	**Lawrence. M**	Growth and characterization of an organic and semi-organic single crystals	**Dr. J. Thomas Joseph Prakash** Government Arts College, Trichy
26	**Leena Garg**	Theoretical Modelling and its experimental verification for the growth of silicon and other multi-crystalline sheets by capillary action shaping technique	**Dr. R. C. Verma** & **Prof. S. M. D. Rao** Punjabi University, Patiala
27	**Loganayaki. M**	Investigation on the growth and characterization of name nonlinear optical and ferroelectric crystals	**Dr. P. Murugakoothan** Pachiyappa's College Chennai-600 030
28	**Lucia Rose. Sr. A.S.J.**	Studies on some L-alanine and Urea based nonlinear optical single crystals grown by solution method	**Dr. P. Selvarajan** Aditanar College of arts and Science, Tiruchendur-628 216
29	**Magesh. M**	Investigation of ternary compound single crystals grown by Bridgman-Stockbarger method for mid IR applications	**Prof. P. Ramasamy** SSN College of Engineering Chennai-603 110
30	**Mary Sheeja. O. V**	Studies on nanomaterial added KDP single crystals	**Prof. C. K. Mahadevan** S.T. Hindu College Nagercoil-629 001
31	**Mathivanan. V**	Investigations on solution and gel grown copper, iron and magnesium doped metal tartarate crystals	**Dr. M. Haris** Karunya University Coimbatore-641 114
32	**Meena. K**	Growth, structure, perfection and characterization of some technologically important crystals	**Prof. S. P. Meenakshisundaram** Annamalai University Chitambaram-608 002
33	**Meenatchi. V**	Synthesis, crystal growth and characterization of some organic crystals and mixed crystals of ADP/KDP	**Prof. S. P. Meenakshisundaram** Annamalai University Chitambaram-608 002
34	**Muthu. K**	Growth, structure, crystalline perfection, characterization and nonlinear optical properties of urea, thiourea, picrate, phthalate, thioxoindenoimidazolone family crystals	**Prof. S. P. Meenakshisundaram** Annamalai University Chitambaram-608 002
35	**Nagapandi Selvi. P**	Synthesis, growth, structure and characterization of phenol, vanillin and phosphate based nonlinear optical single crystals	**Dr. R. Gopalakrishnan** Anna University Chennai-600 025

36	**Neelam Rani**	Synthesis and growth of some organic and semi-organic single crystal for nonlinear optical applications	**Dr. N. Vijayan,** NPL **Dr. M. A. Wahab** Jamia Millia Islamia New Delhi
37	**Nirosha. M**	Growth and characterization of Indole, Pyrrolidine and Quinoline derivatives nonlinear optical single crystals by slow evaporation technique	**Prof. S. Kalainathan** VIT University Vellore-632 014
38	**Pandi. P**	Investigation on the growth and characterisation of 4-aminopyridinium maleate, Picolinium maleate, Picolinium picrate monohydrate and diethylammonium p-hydroxybenzoate nonlinear optical single crystal	**Dr. R. Mohan Kumar** Presidency College Chennai-600 005
39	**Paul M. Dinakaran**	Synthesis, growth and characterization of nitrostilbene derivative on linear optical single crystals by slow evaporation technique	**Prof. S. Kalainathan** VIT University Vellore-632 014
40	**Peramaiyan. G**	Investigation on the growth and characterisation of dyes admixture L-arginine phosphate, 8-hydroxyquinolinium maleate, picolinium tartrate monohydrate and triethlylaminium picrate nonlinear optical single crystals	**Dr. R. Mohan Kumar** Presidency College Chennai-600 005
41	**Prabagaran. G**	Unidirectional growth and characterization of nonlinear optical amino acid based single crystals	**Dr. J. Madhavan** Loyola College Chennai-600 034
42	**Prasanyaa. T**	Growth and characterization of ninhydrin, L-arginine trifluoro acetate and L-tartaric acid nicotinamide single crystals for NLO applications	**Dr. M. Haris** Karunya University Coimbatore-641 114
43	**Prathap. S**	Synthesis, experimental and theoretical investigations on highly efficient organic nonlinear optical ULMA, 3NAA, mNA and BNA single crystals	**Dr. J. Madhavan** Loyola College Chennai-600 034
44	**Prabhakaran. S.P.**	Investigations on Versatile growth method, growth and characterization of potential organic bulk single crystals for NLO applications	**Dr. R. Ramesh Babu** Bharathidasan University Tiruchirappalli-620 024
45	**Pooja Seth**	Growth and investigations of multicrystalline sheets/tubes of various materials (LiF, Silicon) grown by edge defined film fed growth (EFG) technique	**Dr. Shruti Aggarwal** & **Prof. S.M.D Rao** Guru Gobind Singh Indraprastha University, New Delhi
46	**Rajasekar. M**	Crystal growth and characterization of metal thiourea complexes: transition metal doping effects	**Prof. S. P. Meenakshisundaram** Annamalai University Chitambaram-608 002
47	**Radhika. P. V**	Growth and characterization of pure and doped L-arginine acetate single crystal	**Dr. K. Jayakumari** Sree Ayyappa College for Women Nagercoil-629 003
48	**Rathika. A**	Growth and characterization of some organic nonlinear optical crystals	**Dr. R. Ganapathi Raman** Noorul Islam University Kanyakumari-629 180
49	**Rajeev Gandhi. J**	Growth of pure and doped potassium Titanyl Phosphate (KTP) crystals by flux technique and their characterization	**Prof. M. Rathnakumari** Velammal Engineering College Chennai-600 066
50	**Renuka Devi. K**	The role of charge compensation mechanism and the effect of various crystallization processes on the nucleation and growth of glycine polymorphs	**Prof. K. Srinivasan** Bharathiyar University Coimbatore-641 046
51	**Renuga Devi. R**	Structure, growth and characterization of beta alanine based metal organic and acid- base nonlinear optical single crystals	**Dr. R. Kesavasamy** Sri Ramakrishna Engg., College Coimbatore-641 022
52	**Riscob. B**	Growth and characterization of nonlinear optical single crystals of pure and doped lithium niobate and a few semi-organic single crystals	**Prof. M. A. Wahab** & **Dr. G. Bhagavannarayana** NPL & Jamia Millia Islamia New Delhi

53	**Rubu Nirmala. L**	Crystal growth and characterization of doped and undoped semi-organic NLO crystals	**Dr. J. Thomas Joseph Prakash** Government Arts College Trichy-621 201
54	**Sarath Chandra Veerla**	Investigations on metal ions doped nano crystalline Hydroxyapatite	**Dr. S. Narayana Kalkura** Anna University Chennai-600 025
55	**Saravana Kumar. G**	A combined experimental and theoretical investigations on N,N'-Diphenylguanidine based single crystals for nonlinear optical applications	**Dr. P. Murukakoothan** Pachaiyappa's College Chennai-600 030
56	**Sangeetha. K**	Effect of growth methods, doping, ion irradiation and implantation on the physical properties of L-arginine monohydrochloride monohydrate and L-arginine monohydrobromide monohydrate single crystals	**Dr. R. Ramesh Babu** Bharathidasan University Tiruchirappalli-620 024
57	**Senthil Murugan. G**	Growth and characterization of certain semi-organic and organic single crystals	**Prof. P. Ramasamy** SSN College of Engineering Chennai-603 110
58	**Selvapandiyan. M**	Crystal growth, structural, spectral, optical, thermal and mechanical studies of nonlinear optical pure and doped zinc tris thiourea sulphate single crystals	**Dr. P. Sundaramoorthi** Thiruvalluvar Government Arts College, Namakkal
59	**Shakila. K**	Growth and characterisation of organic-inorganic hybrid single crystals by slow evaporation technique	**Prof. S. Kalainathan** VIT University Vellore-632 014
60	**Sudhahar. S**	Investigations on the growth and characterization of p-Hydroxybenzoate based 4-methylpyridinium, 2-amino-4, 6-dimethylpyrimidinium, 2-phenylethylammonium derivatives and rare earth ions (Y^+, Sm^+) doped KAP nonlinear optical crystals	**Dr. R. Mohan Kumar** Presidency College Chennai-600 005
61	**Sudha. C**	Nucleation control, separation and growth of mono, ortho and unstable polymorphs of the Pharmaceutical solid Paracetamol through various crystallization processes	**Prof. K. Srinivasan** Bharathiyar University Coimbatore-641 046
62	**Suja Rani. J**	Growth and characterization of semiorganic NLO mixed crystals (LHC-LHB)	**Dr. K. Jayakumari** Sree Ayyappa College for Women, Nagercoil-629 003
63	**Suvitha. A**	Growth and characterization of Guanidinium based organic and semi-organic single crystals for nonlinear optical applications	**Dr. P. Murukakoothan** Pachaiyappa's College Chennai-600 030
64	**Thilagavathy. S.R**	Studies on the growth and characterization of organic NLO single crystals	**Dr. K. Amubujam** Queen Mary's College Chennai-600 004
65	**Uma. B**	Investigations on the growth and characterization of nonlinear optical D-PGHCl, BD-PGSMH, 2FA and LA2FA single crystals	**Dr. B. Milton Boaz** Presidency College Chennai-600 005
66	**Vasudevan. V**	Studies on conventional and unidirectional growth of L-Lysine based semi-organic single crystals for nonlinear optical applications	**Dr. R. Ramesh Babu** Bharathidasan University Tiruchirappalli-620 024
67	**Vivek. P**	Investigation on potential organic semi-organic single crystals for nonlinear optical device applications	**Dr. P. Murukakoothan** Pachaiyappa's College Chennai-600 030
68	**Jayaramakrishnan. V**	Birefringence spectrometry investigations applied to certain technologically important single crystals	**Dr. G. Bhoopathi** PSG Arts and Science College Coimbatore-641 014
69	**Joseph Daniel. D**	Thermoluminescence and optically stimulated luminescence studies on fluoride and oxide crystals for radiation dosimetry applications	**Prof. P. Ramasamy** SSN College of Engineering Chennai-603 110

CRYSTAL GROWTH PROJECTS IN THE YEAR OF 2014

Dr. R. Arun Kumar, Assistant Professor, GRD Centre for Materials Research
PSG College of Technology, Coimbatore-641 004, Tamilnadu

Project Title : Growth and characterization of Oxide single crystals with near-biological tissue equivalency for dosimetric application

Funding Agency: UGC-DAE CSR **Year :** 2014-2017 **Amount :** Rs. 7.39 lakhs

Prof. S. Asath Bahadur, Department of Physics,
Kalasalingam University, Krishnankoil-626 126, Tamilnadu

Project Title : A search for the new NLO crystals for industrial applications from anisidine and guanidine compounds

Funding Agency : CSIR **Year :** 2014-2016 **Amount :** Rs. 12.27 lakhs

Dr. T. Balakrishnan, Associate Professor, PG & Research Department of Physics,
Periyar EVR College, Tiruchirappalli-620 023, Tamil Nadu

Project Title : L-Lysine derivatives: Synthesis, structure solution, crystal growth, optical, spectral, thermal, mechanical and nonlinear optical properties

Funding Agency : CSIR **Year :** 2014-2017 **Amount :** Rs. 7.82 lakhs

Dr. P. Dhanasekaran, Associate Professor, Department of Physics,
Erode Sengunthar Engineering College, Erode-638 057, Tamilnadu

Project Title : Nucleation control, separation and crystallization of L-glutamic acid polymorphs by solution growth technique and growth & characterization of single crystals of L-glutamic acid derivatives

Funding Agency : BRNS **Year :** 2014-2017 **Amount :** Rs. 24.59 lakhs

Dr. Gajanan G. Muley, Assistant Professor, Department of Physics,
Sant Gadge Baba Amravati University, Amravati-444 602, Maharastra

Project Title : Design, growth and study of amino acid based semiorganic crystals for nonlinear optical applications

Funding Agency : DST-SERB **Year :** 2014-2017 **Amount :** Rs. 36.10 lakhs

Prof. Hussaini Syed Shuakatullah Azmatullah, Head, Department of Physics,
Milliya Arts Science & Management Science College, Beed-431 004, Maharastra

Project Title : Growth and characterizations of high quality NLO crystals for frequency conversion devices

Funding Agency : DST **Year :** 2014-2016 **Amount :** Rs. 18.75 lakhs

Prof. S. Kalainathan, Deputy Director, Centre for Crystal Growth, School of Advanced Sciences, VIT University, Vellore-632 014, Tamilnadu

Project Title : Growth and characterization of 1,3,5 tri phenyl benzene by solution growth technique

Funding Agency: BRNS **Year :** 2014-2017 **Amount :** Rs. 13.16 lakhs

Dr. V. N. Mani, Scientist-E, UIlltra High Pure Materials Division, Centre for Materials for Electronics Technology, Hyderabad- 5OO 051, Andhra Pradesh

Project Title : Design and development of crystal growth system preparation high pure gallium nitride for LED and other related optoelectronic applications

Funding Agency : DST **Year :** 2014-2017 **Amount :** Rs. 72.69 lakhs

PI: Prof. P. Ramasamy, Dean (Research), SSN College of Engineering, Chennai-603 110, Tamilnadu
Co-PI: Dr. G. Anandha Babu, Assistant Professor, Department of Physics, SSN College of Engineering, Chennai-603 100, Tamilnadu

Project Title : Development of improved DS process for mc-Si wafers and their application to Solar Cells

Funding Agency : MNRE **Year :** 2014-2017 **Amount :** Rs. 4.68 crores

Dr. N.P. Rajesh, Assistant Professor, Department of Physics, SSN College of Engineering, Chennai-603 110, Tamilnadu

Project Title : Development and characterization of PMN-PT single crystals for under water applications

Funding Agency : DST-SERB **Year :** 2014-2017 **Amount :** Rs. 35.50 lakhs

Dr. C. Ramachandra Raja, Associate Professor, Department of Physics, Government Arts College, Kumbakonam-612 001, Tamilnadu

Project Title : Development of Potassium Pentaborate crystals for efficient nonlinear optical devices

Funding Agency : CSIR **Year :** 2014-2017 **Amount :** Rs. 7.24 lakhs

Dr. G. Vinitha, Assistant Professor, School of Advanced Sciences, VIT University, Chennai-600 127, Tamilnadu

Project Title : Growth and characterization of organo-metallic thiocyanate crystals for nonlinear optical device applications

Funding Agency : BRNS **Year :** 2014-2017 **Amount :** Rs. 21.55 lakhs

CONFERENCE HIGHLIGHTS

XVIII National Seminar on Crystal Growth (XVIII NSCG-2014)
February 24-26, 2014, (Sponsored by IACG, DST-SERB, CSIR, BRNS)

Centre for Crystal Growth, SSN College of Engineering, Chennai-603 110, TN

The 18th National Seminar on Crystal Growth 2014 (XVIII NSCG-2014) was jointly organized by the Indian Association for Crystal Growth (IACG) during 24-26 February, 2014 at Centre for Crystal Growth, SSN College of Engineering, Kalavakkm-603 110, Chennai, Tamilnadu. The scientific deliberations at the seminar is covered a wide range of topics in Crystal Growth in the form of invited talks and contributory papers. Accepted contributory papers are presented as Oral and Poster presentation. The XVIII NSCG-2014 provides a platform for the research community in crystal growth to meet, discuss and share the latest advances in these fields. **Prof. P. Ramasamy** is the Convenor and **Dr. Muthu Senthil Pandian** is the Co-Convenor of the conference. Prof. S. Salivahanan, Principal, SSN CE welcomed the guests and participants. Prof. P. Ramasamy, Convenor-XVIII NSCG-2014, SSN College of Engineering, presented the theme of the conference and Mrs. Kalavijaykumar, President, SSN Institutions gave the Presidential address. **Prof. G. Bhagavannarayana**, Head, Crystal Growth Section, National Physical Laboratory (NPL), New Delhi inaugurated the conference. Dr. Muthu Senthil Pandian, Co-Convener, XVIII NSCG-2014 proposed the vote of thanks.

The technical scientific programme of the conference had **34 Invited lectures**, **103 oral presentations** and **102 poster presentations**. As the crystal growth is an interdisciplinary subject of research, it was conducted with the aim of making this seminar as a common platform for the Research Scholars and the students working in different areas of research to meet and discuss on the recent trends in the various advanced fields of research. XVIII-NSCG-2014 attracted a large number of research scholars and received two hundred and five (205) national contributions. The participants of the seminar witnessed the presentation on crystal growth and fabrication of devices for various applications. Thus the seminar became the source for learning and enriching the knowledge of the participants in the field of crystal growth and related areas. In this seminar participants presented research papers in the growth of piezoelectric, dielectric, ferroelectric, acousto-optic and nonlinear optical (NLO) crystals. Many papers reported the growth of crystals employing the novel Sankaranarayanan-Ramasamy (SR) unidirectional growth technique.

Thus, the scientist and researchers from various national laboratories, universities and research centers of our country participated in the above seminar and discussed on the growth of single crystals from various techniques. Further, deposition of thin films, nanostructured materials from various techniques and revealing their properties from various experimental techniques were presented. The students participated from various education and research institutes, interacted with the experts working in the areas of crystal growth, thin films and material science and enriched their knowledge in these areas. The seminar as a whole motivated and guided the participants to carry out their research in their respective fields and to produce many novel results. Thus the XVIII NSCG-2014 successfully ended by fulfilling the aim for which the seminar was organized.

Prof. S. M. Rao
Institute of Physics, Academia Sinica, 128 Sec.2, Nankang, Tacpipei-11529, Taiwan

CONFERENCE HIGHLIGHTS

UGC Sponsored National Seminar on Recent Trends in Crystal Growth and Nano Materials (NSCGNM-2014), August 7-9, 2014

PG and Department of Physics, National College, Trichy-620 001, Tamilnadu

National Seminar on **Recent Trends in Crystal Growth and Nano Materials (NSCGNM 2014),** was organized by the PG & Research Department of Physics, National College, Tiruchirappalli-620 001 in association with Indian Association for Crystal Growth during 7-9, August 2014. The convener, **Dr. A.T. Ravichandran,** successfully organized the NSCGNM 2014. **Dr. K. Baskar,** Director, Crystal Growth Centre, Anna University, Chennai inaugurated the UGC Seminar. **Dr. G. Bhagavannarayana**, CSIR-National Physical Laboratory, New Delhi, presented key note address. **Dr. R. Chandramohan**, Principal, Sree Sevugan Annamalai College, Devakottai and **Dr. Baneto Paul,** Sir C.V. Raman Fellow & Professor of Physics, University of Lome, West Africa and **Dr. S. Kumararaman,** Head, Department of Physics, Nehru Memorial College offered felicitations. 20 Invited lectures and more than 50 contributed papers presented by the researchers from various research institutions, State and Central Universities and Colleges. 150 delegates from 64 institutions participated in this seminar.

The broad topics like Crystal Growth, thin films and nanomaterials were discussed in the invited lectures. Topics like III- Nitrates for energy applications, advances in NLO materials, nano crystalline based oxide materials for energy storage devices (Lithium ion batteries), advances in nano-structure based thin films, X-ray Crystallography, electron diffraction studies, advances in high quality large size single crystals grown by various melt techniques for Piezoelectric, Mid-IR, Luminescence and Scintillator applications. Ferroelectric Single Crystals for Second Harmonic Generation (SHG) and Infrared (IR) Detector Applications and the preparation of Graphene-metal oxide composites with improved properties for Energy and Environmental applications were discussed. Young researchers were presented their research work in Oral and poster presentation section. The topics discussed by the young researcher were Crystal growth of Ferroelectric and NLO single crystals, Preparation of thin films by epitaxial and other techniques and preparation of nanomaterials.

The valedictory address was given by **Prof.P.Ramasamy**, Dean of Research, SSN College of Engineering, Chennai. **Prof.M.Jayachandran**, Deputy Director & Chief Scientist, CSIR-CECRI, Karaikudi, **Prof.R.Jayavel**, Director, Centre for Nanoscience and Technology, Anna University, Chennai and **Dr. Saaminathan**, Galaxy Research Technologies, Singapore offered felicitations. In order to motivate the scientific temper the awards were given to best oral and poster presentation. The summary of this seminar was given by Convener **Dr. A.T. Ravichandran**. The students participated from various education and research institutes interacted with the experts working in the areas of crystal growth, thin films and material science and enriched their knowledge in these areas. The seminar as a whole motivated and guided the participants to carry out their research in their respective fields and to produce many novel results. Thus the **NSCGNM 2014** successfully ended by fulfilling the aim for which the seminar was organized.

Dr. R. Ramesh Babu
Assistant Professor, Crystal Growth and Thin Film Laboratory
Department of Physics, Bharathidasan University, Thiruchirappalli-620 024, Tamilnadu

CONFERENCE HIGHLIGHTS

International Conference on Materials and Characterization Techniques (ICMCT-2014), 10-12, March 2014, (Sponsored by DST, BRNS, DRDO Ametek, Carlzeiss, Netzsch)

Centre for Crystal Growth, School of Advanced Sciences, VIT University, Vellore-632 014

International Conference on Materials and Characterization Techniques (ICMCT-2014) was organized by Centre for Crystal Growth, School of Advanced Sciences, VIT University during 10-12th March 2014. The Convenor, **Dr. S. Kalainathan**, Deputy Director, Centre for Crystal Growth, VIT University and their team members of School of Advanced Sciences successfully organized the conference. The scope of this International conference was to deal with emerging trends in various branches of Material Sciences such as Crystal Growth, Thin film, Nano materials and polymer.

ICMCT-2014 fascinated a large number of delegates all over the world. Around 800 participants and more than 70 invited speakers all over the world made the conference a great success. The conference provided an opportunity for different area of delegates to exchange new ideas and experience face to face research relations and to find global partners for future collaboration. The conference laid a platform for discussions about the latest advancements in various fields of research like Crystal Growth, Thinfilms, Nanotechnology and Polymer technology. The conference covering a wide range of topics created interest among the young research scholars to know about various techniques involved in growing single crystals, novel techniques involved in synthesizing Nano materials, Thin films and Polymers.

Invited speakers from various countries delivered their talks in recent advancements in growing single crystals by various techniques like solution growth, melt growth (Bridgman technique, float zone technique, flux growth etc). Research scholars were benefited in knowing about the various techniques for crystal growth and got to know about new ideas in characterizing a single crystal. Speakers and participants for various institutes gave talk about the various nano material synthesis process. The advance instrumentations for characterizing these nano materials were also discussed. The latest techniques involved in the formation of thin films and applications of polymer technology in dielectric, biomaterials, etc were also a part of a session. The conference had both oral and poster presentation covering all the above mentioned conference theme. Students, delegates and experts had a great opportunity to have discussion and enhance their research career. The research scholars from various institutes got an opportunity to interact with the experts working in various fields like Crystal growth, Thin films, Nano materials, Polymer technology. As a whole the conference motivated and guided the young participants to carry out their research in a novel way. Around 800 participants, more than 70 invited speakers all over the world, Government (DST, BRNS, DRDO) and Industrial funding (Ametek, Carlzeiss, Netzsch, etc.) agencies made this conference a great success.

Prof. S. Kalainathan
Centre for Crystal Growth, VIT University,
Vellore-632 014

CONFERENCE HIGHLIGHTS

UGC Sponsored National Seminar on Recent Advances in Materials Science (RAMS-2014), February 3-4, 2014

Crystal Growth and Thin Film Laboratory, Department of Physics,
Bharathidasan University, Tiruchirappalli-620 024

Materials science is an important key field in the development potential devices and its an ever growing regime. Topical seminars and conferences on rapidly growing field like this is an essential task to develop the understanding on recent trends in the area. With this objective, the *Department of Physics, Bharathidasan University, Tiruchirappalli* has organized a two day seminar on "**Recent Advances in Materials Science (RAMS-2014)**" during *February 3-4, 2014*.

The conference was inaugurated by **Prof. S. Moorthy Babu**, Anna University, Chennai and presided over by **Dr. A. Selvam**, Controller of Examination, Bharathidasan University. The seminar gained around *200 participants* and it had *22 oral presentations* and *40 poster presentations*. Many prominent personalities from various institutions such as, **Prof. S. Moorthy Babu, Prof. K. Ramamurthi, Dr. N. Vijayan, Prof. K. Sankaranarayanan, Prof. S. Arumugam, Dr. S. Brahadeeshwaran and Dr. R. Arun Kumar** were delivered their invited lectures and shared their views on material science and related issues on the first day. They focused on the development of low cost solar cells, materials for detector applications, unidirectional growth of various materials, recent developments in superconductivity, solution techniques for processing flexible organic semiconductor single crystals and Borate materials for NLO applications.

On the second day the gathering had a very lively session on high quality single crystals by various melt growth techniques for Scintillator and other applications delivered by **Prof. P. Ramasamy.** Followed by some nice sessions on Growth of special property magnites by **Prof. Suryanarayanan**, Semiconductor nanowires for hydrogen gas generation by **Dr. Jeganathan**, Structures of androstene derivatives by **Dr. G. Vasuki**, Special electron injection layers for OLED's by **Dr. Sethuraman** and the role of unidirectional growth in crystalline perfection for the NLO and ferroelectric applications by **Dr. Muthu Senthil Pandian**. At the end of the day, the function was validicted by **Prof. P. Ramasamy**, presided over by **Prof. M. Lakshmanan**. In valedictory session there was three best oral and three best poster presentations to motivate the young researchers and the prizes were distributed by the dignitaries. In summary, I hope the seminar provided fruitful lectures to the audience and it would have definitely ignited the sparks on the younger minds towards materials science research.

Prof. K. Ramamurthi
Department of Physics & Nanotechnology, Faculty of Engineering & Technology
SRM University, Kattankulathur-603 203, Tamilnadu

SOME OF THE CRYSTAL GROWTH RESEARCH GROUPS

Prof. K. Srinivasan and his Ph.D. students in Department of Physics, Bharathiyar University, Coimbatore-641 046, Tamilnadu

Prof. S.S. Hussaini & **Prof. M.D. Shirsat** research group in Department of Physics, Milliya Arts & Science College, Beed-431 004, Maharastra

Prof. K. Sankaranarayanan and his Ph.D. Students in Department of Physics, Alagappa University, Karaikudi-630 003, Tamilnadu

Dr. N. Vijayan, Senior Scientist and his Ph.D. Students in Crystal Growth and X-ray Analysis Section, National Physical Laboratory (NPL), New Delhi-110 012

Dr.K. Ramachandra Rao, and his Ph.D. students in Crystal growth & Nanoscience Research Centre, Government College, Rajahmundray-05, Andra Pradesh

Prof. Dattatray Gadkari and his students in Department of Physics, Mithibai College Mumbai-400 056, Maharastra

LIST OF JOURNALS WITH IMPACT FACTOR – MARCH 2015

(Crystal Growth papers appear in these journals)

Journal Name	IF
Advanced Functional Materials	**10.4**
Advanced Optical Materials	**10.88**
Applied Surface Science	**2.538**
Applied Physics A : Materials Science and Processing	**1.694**
Bulletin of Materials Science	**0.870**
Chinese Science Bulletin	**1.365**
Crystal Growth and Design	**4.558**
Crystal Engineering Communication	**3.88**
Crystal Research and Technology	**1.12**
Current Applied Physics	**1.999**
Ferroelectrics	**0.383**
Japanese Journal of Applied Physics	**1.057**
Journal of Crystal Growth	**1.333**
Journal of Applied Crystallography	**3.95**
Journal of Alloys and Compounds	**1.657**
Journal of Physics and Chemistry of Solids	**1.174**
Journal of Physics D: Applied Physics	**2.521**
Journal of Solid State Chemistry	**2.386**
Journal of Physics: Condensed Matter	**2.223**
Journal of Materials Chemistry	**6.626**
Journal of Materials Science and Technology	**1.610**
Journal of Materials Science: Materials in Electronics	**1.966**

Journal Name	IF
Journal of Thermal Analysis and Calorimetry	**2.206**
Materials Letters	**2.269**
Materials Chemistry and Physics	**2.427**
Materials Research Bulletin	**1.968**
Materials Science and Engineering A	**2.409**
Materials Science and Engineering B	**2.122**
Materials Characterizations	**1.925**
New Journal of Chemistry	**3.159**
Optical Materials	**2.075**
Optics Communications	**1.542**
Optics and Laser Technology	**1.649**
Optik- International Journal for Light and Electron Optics	**0.769**
Progress in Crystal Growth and Characterization of Materials	**1.476**
Physica B:Condensed Matter	**1.276**
Science of Advanced Materials	**2.908**
Solid State Communications	**1.698**
Solid State Science	**1.679**
Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy	**2.129**
Surface Science Letters	**1.870**
Synthetic Metals	**2.222**
Nuclear Instruments and Methods in Physics Research Section: B	**1.324**
The European Physical Journal of Applied Physics	**0.789**

PAST CONFERENCES/SEMINARS/WORKSHOPS

Abstract book released on the occasion of XVIII National Seminar on Crystal Growth (XVIII NSCG-2014) held at SSN College of Engineering on 24-26 February 2014

Inauguration of International Conference on Materials and Characterization Techniques (ICMCT-2014) held at VIT University, Vellore on 10-12 March 2014

Prof. S. Moorthy Babu handing over the Memento to **Prof. G. Ravi** in ICMCT-2014 held at VIT University, Vellore on 10-12 March 2014

Resource persons in the Inaugural function of ICCGBC-2014 at Sastra University, Thanjavur on 28-29 November 2014 organized by **Dr. R. Bairavaganesh**

Prof. K. Sankaranarayanan handing over the Memento to **Prof. K. Ramamurthi** in the RAMS-2014 held at Bharathidasan University, 3-4 February 2014

The chair person handing over the Memento to **Dr. C. Ramachandra Raja** in the NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

Resource persons in the NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

The chair person handing over the Memento to **Dr. N. Vijayan**, NPL, New Delhi in ICMCT-2014 held at VIT University, Vellore on 10-12 March 2014

The chair person handing over the Memento to **Prof. H.L. Bhat**, IISc, Bangalore in ICCGBC-2014 held at Sastra University, Thanjavur on 28-29 November 2014 organized by **Dr. R. Bairavaganesh**

Prof. K. Porsezian received first copy of *Science IJSTH Journal* from **Dr. K. Arul,** Principal, SVM College in Department of Physics, Sri Vidya Mandir Arts & Science College, Uthangarai, 2-3 January 2015

Prof. K. K. Bamzai with his Ph.D. Scholars during International Conference on Electron Microscopy & XXXV Annual Meeting of Electron Microscope Society of India (EMSI) held at University of Delhi, 9-11 July 2014

Dr. K. Ramachandra Rao handing over the Memento to **Prof. S. Jerome Das**, Loyola College, Chennai in the ATOM-2014 held at Department of Physics, Government College, Rajahmundry, 8-9 December 2014

The chair person handing over the Memento to **Dr. R. Ramesh Babu** in the NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

Department of Physics Faculty, The American College, Madurai organized One Day State Level Seminar on Recent Trends in Solar Energy Materials and Technologies on February 2014

Inauguration of 2nd National Conference on Hierarchically Structured Materials (NCHSM-2014) held at SRM University, Chennai, 24-25 March 2014

Prof. G. Ravi handing over the Memento to **Prof. R. Jayavel** in ICMCT-2014 held at VIT University, Vellore on 10-12 March 2014

Resource persons in ICCGBC-2014 held at Sastra University, Thanjavur on 28-29 November 2014 organized by **Dr. R. Bairavaganesh**

Resource persons visited the Crystal Growth laboratory developed by **Prof. S. S. Hussaini** during the NCMST-2014 held at Department of Physics, Milliya Arts & Science College, Maharastra, 23-24 December 2014

The organizers handing over the Memento to **Prof. P. Ramasamy** in the RAMS-2014 held at Department of Physics, Bharathidasan University, 3-4 February 2014

Abstract book released on the occasion of NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

Prof. S. S. Hussaini handing over the Memento to the resource person in the NCMST-2014 held at Department of Physics, Milliya Arts & Science College, Beed, Maharastra, 23-24 December 2014

Prof. P. Ramasamy handing over the Memento to **Dr. V. Saminathan** in the NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

Prof. S. M. Rao giving Valedictory address in the International Conference on Materials and Characterization Techniques (ICMCT-2014) at VIT University, Vellore on 10-12 March 2014

Dr. L. Sudha handing over the Memento to **Dr. U. Madhusoodanan**, IGCAR, Kalpakkam during the Inaugural function in NCHSM-2014 held at SRM University, Chennai, 24-25 March 2014

Prof. P. Ramasamy giving the Valedictory address in the NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

The release of Abstract Book in the RAMS-2014 held at Department of Physics, Bharathidasan University, 3-4 February 2014

Prof. Kalainathan, Prof M.J.Joshi, Prof. K.K.Bamzai, Dr.Bharat Parekh during International Conference on Materials and Characterization Techniques (ICMCT- 2014) held at VIT University, Vellore, 10-12 March 2014

The chair person handing over the Memento to the **Dr.Gajanan Muley** in the NCMST-2014 held at Department of Physics, Milliya Arts & Science College, Beed, Maharastra, 23-24 December 2014

Prof. K. Jeganathan handing over the Memento to **Dr. K. Sethuraman, MK University** in the RAMS-2014 held at Bharathidasan University, 3-4 February 2014

Prof.R.Srinivasan, IASc-Bangalore handing over the Memento to **Dr.Muthu Senthil Pandian**, SSN RC, Chennai in Science Academies refresher course held at Department of Physics, Government College, Rajahmundry, 27th May 2014

Dr. S. Pari handing over the Memento to **Prof. P. Ramasamy** in the NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

Prof. S. Arumugam handing over the Memento to **Prof. K. Ramamurthi, SRM University** in the RAMS-2014 held at Bharathidasan University, 3-4 February 2014

Prof. P. Ramasamy & Dr. G. Bhagavannarayana inaugurating ***Crystal Growth & Nanoscience Research Centre*** during the ATOM-2014 held at Department of Physics, Government College, Rajahmundry, 8-9 December 2014

Dr. P. Selvarajan delivered Invited Lecture in the National Seminar on Crystal Science and Nanotechnology held at Government Arts College, Karur on 6th November 2014

The chair person handing over the Memento to the **Dr.Muthu Senthil Pandian**, SSN RC, Chennai in the NCMST-2014 held at Department of Physics, Milliya Arts & Science College, Beed, Maharastra, 23-24 December 2014

Inauguration of National Workshop on Advance Materials (NWAM-2014) held at PSG College of Technology, Coimbatore on 28th February 2014 organized by **Dr. R. Arun Kumar**

Abstract book released by **Prof. P. Ramasamy** & **Prof. C. K. Mahadevan** on the occasion of ETTEP-2015 held at Department of Physics, Sree Ayyappa College for Women, Kanyakumari on 8-9 January 2015

Prof. S. Arumugam handing over the Memento to **Prof. S. Moorthy Babu,** Anna University, Chennai during the Inaugurational function of RAMS-2014 held at Bharathidasan University, 3-4 February 2014

The Convenor **Dr.S. Subramanian** handing over the Memento to **Dr. Muthu Senthil Pandian**, SSN RC, Chennai in NCRTAP-2015 held at PG Department of Physics, The M.D.T. Hindu College, Tirunelveli on 19-20 February 2015

Abstract book released on the occasion of ATOM-2014 held at Department of Physics, Government College, Rajahmundry, 8-9 December 2014

Inauguration of National Seminar on Emerging Trends in Theoretical & Experimental Physics (ETTEP-2015) held at Department of Physics, Sree Ayyappa College for Women, Kanyakumari on 8-9 January 2015

Prof. K. Jeganathan handing over the Memento to **Prof. M. Lakshmanan** during the Inaugural function of RAMS-2014 held at Bharathidasan University, 3-4 February 2014

The organizer handing over the Memento to **Prof. P. Ramasamy, SSN CE** during the Inaugural function in NCMMW-2014 held at Department of Physics, Easwari Engineering College, Chennai , 10-11 September 2014

The chair person handing over the Memento to **Dr. R. Mohan Kumar,** Presidency College in ICMCT-2014 held at VIT University, Vellore on 10-12 March 2014

Inauguration of 3rd National Seminar on Technologically important Crystalline & Amorphous Solids (TICAS-2014) held at Department of Physics, Kalasalingam University on 28 February-1st March 2014

Inauguration of International Conference on Materials and Characterization Techniques (ICMCT-2014) held at VIT University, Vellore on 10-12 March 2014

Prof. P. Ramasamy, SSN CE during the Valedictory function in NCHSM-2014 held at SRM University, Chennai, 24-25 March 2014

Dr. R. Siva Kumar handing over the Memento to **Dr. G. Vasuki** in the NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

Abstract book released on the occasion of NCRTAP-2015 held at PG Department of Physics, The M.D.T. Hindu College, Tirunelveli on 19-20 February 2015

Inauguration of International Conference on Materials and Characterization Techniques (ICMCT-2014) held at VIT University, Vellore on 10-12 March 2014

Prof. P. Ramasamy handing over the Memento to **Dr. Muthu Senthil Pandian**, SSN RC, Chennai in the NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

Dr. R. Rudramoorthy, Principal, PSG CT handing over the Memento to **Dr. G. Bhagavannarayana**, NPL, New Delhi in the NWAM-2014 held at PSG College of Technology, Coimbatore on 28th February 2014 organized by **Dr. R. Arun Kumar**

The chair person handing over the Memento to the **Prof. M.D. Shirsat,** Dr.BAM University in the NCMST-2014 held at Department of Physics, Milliya Arts & Science College, Beed, Maharastra, 23-24 December 2014

The chair person handing over the Memento to **Dr. M. Arivanandhan,** Anna University, Chennai in ICMCT-2014 held at VIT University, Vellore on 10-12 March 2014

Dr. S. Brahadeeswarn handing over the Memento to **Prof. P. Ramasamy, SSN CE** in the RAMS-2014 held at Department of Physics, Bharathidasan University, 3-4 February 2014

Prof. P. Ramasamy handing over the Memento to **Prof. R. Jayavel** in the NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

The chair person handing over the Memento to **Dr. N. Vijayan,** NPL, New Delhi in the RTNTA-2014 held at KLN College of Engineering, 18-19 September 2014

Prof. P. K. Palanisamy handing over the Memento to **Dr. K. Sethuraman,** MK University, Madurai in the RTNTA-2014 held at KLN College of Engineering, 18-19 September 2014

Dr. D.B. Gadkari and some research scholars in Crystal Growth Workshop at Physics Department, Shivaji University Kolhapur on December 2014

Inauguration of One day workshop on Laser Meteorology held at Department of Physics, Sacred Heart College, Tirupattur on 27 January 2014

Invited Speakers in XVIII National Seminar on Crystal Growth

Dr. Binay Kumar handing over the Memento to **Prof. P. Ramasamy** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. Binay Kumar handing over the Memento to **Prof. S.M. Rao** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. Binay Kumar handing over the Memento to **Dr. G. Bhagavannarayana** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. G. Bhagavannarayana handing over the Memento to **Dr. P. Selvarajan** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Prof. S.M. Rao handing over the Memento to **Dr. Binay Kumar** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. U. Madhusoodanan handing over the Memento to **Prof.S.P. Meenakshisundaram** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. U. Madhusoodanan handing over the Memento to **Dr. Suja Elizabeth** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Prof.S.P. Meenakshisundaram handing over the Memento to **Dr. N. Vijayan** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Prof.S.P. Meenakshisundaram handing over the Memento to **Dr. S. Brhadeeswaran** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Prof. K. Sankaranarayanan handing over the Memento to **Prof. A. Chandramohan** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Prof. P. Ramasamy & Dr. P. Selvarajan handing over the Memento to **Prof. P. Sureshkumar** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. S. Ganesamoorthy handing over the Memento to **Dr. R. Mohan Kumar** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. S. Ganesamoorthy handing over the Memento to **Prof. D. Rajan Babu** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. P. Murugakoothan handing over the Memento to **Dr. R. Ramesh Babu** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Prof. S.P. Meenakshisundaram handing over the Memento to **Prof. C.K. Mahadevan** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Prof. K. Sankaranarayanan handing over the Memento to **Dr. K. Sethuraman** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

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Prof. S. Kalainathan handing over the Memento to **Dr. U. Madhusoodanan** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. P. Selvarajan handing over the Memento to **Dr. C. Ramachandra Raja** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Dr. G. Bhagavannarayana handing over the Memento to **Prof. S. Jerome Das** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

Prof. X. Sahaya Shajan handing over the Memento to **Dr. P. Rajesh** in the XVIII NSCG-2014 held at CCG, SSN College of Engineering on 24-26 February 2014

INDIAN ASSOCIATION FOR CRYSTAL GROWTH

SSN Research Centre, SSN College of Engineering, Chennai-603 110, TAMILNADU

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Research Scientist, SSN RC
Editor-IACG News Letter

IACG "PROF.P.RAMASAMY NATIONAL AWARD FOR CRYSTAL GROWTH"

Norms for the Award

1. Any Indian Scientist who has contributed to the field of crystal growth is eligible for the award.
2. Any foreign scientist who has contributed to the development of crystal growth activities in India is eligible for the award.
3. Individual or Institution/Laboratory can be considered for the award.
4. Preference will be given to the crystal growth research carried out in India.
5. The research works carried out in the preceding five years of the year of award to be considered primarily for the award.
6. There is no age limit.
7. Self nomination/Nomination by the member of IACG/Nomination by an Institution can be accepted.
8. Scientist/Institution awarded once will be eligible for this award again only after five years from the date of previous award.
9. Award will be given once in two years, initially. Any more donation from any donor under same title is to be additive to the sum already donated and the award can be given annually.
10. The President, IACG may take the advice of the committee constituted by him for the purpose of selecting suitable awardee (s) and the decision of the President will be final.

HONORS/AWARDS

Inauguration of Advanced Technology Oriented Materials (ATOM-2014) held at Department of Physics, Government College, Rajahmundry on 8-9 December 2014

The Principal, National College, Trichy handing over the Memento to **Dr. G. Bhagavannarayana** during the Inaugural function of NSCGNM-2014 held at The National College, Trichy, 7-9 August 2014

The organizer **Dr.K. Ramachandra Rao** handing over the Memento to **Prof. P. Ramasamy** in the ATOM-2014 held at Department of Physics, Government College, Rajahmundry on 8-9 December 2014

Dr. K. Sankaranarayanan handing over the Memento to **Dr. S. Brahadeeswarn** in the RAMS-2014 held at Bharathidasan University on 3-4 February 2014

The organizer handing over the Memento to **Prof. P. Ramasamy** during the Inaugural function of ICMCT-2014 held at VIT University, Vellore on 10-12 March 2014

Dr. R. Ramesh Babu handing over the Memento to **Prof. K. Ramamurthi** in the RAMS-2014 held at Bharathidasan University on 3-4 February 2014

The release of IACG News Letter-2014, Issue-26 in XVIII National Seminar on Crystal Growth held at CCG, SSN College of Engineering, Chennai during February 24-26, 2014

"Best Oral Presentation Award" Winners at XVIII NSCG-2014 held at CCG, SSN College of Engineering, Chennai during February 24-26, 2014

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