National Recognitions

- UGC - SAP (DRS-II)
- DST - FIST (Level - 1, Phase 3.0)
- DST - PURSE 2.0
- MHRD RUSA 1.0 (R & I)
Faculty Members

- Dr. K. Jeganathan
  Professor and Head

- Dr. S. Rajasekar
  Professor and Chair

- Dr. S. Arumugam
  Professor

- Dr. P. Muruganandam
  Associate Professor

- Dr. R. Ramesh Babu
  Assistant Professor

- Dr. T. C. Sabari Girisun
  Assistant Professor

- Mr. D. Samson Daniel
  Guest Lecturer

- Mr. M. Prabaharan
  Guest Lecturer
Preface

The Department of Physics was originally established in 1976 as a unit of the Autonomous Post-Graduate Centre of the University of Madras at Tiruchirappalli (the present Khajamalai Campus) and became the part of Bharathidasan University in 1982 with Prof. P. K. Ponnuswamy (the former Vice-Chancellor of University of Madras and Madurai-Kamaraj University) as the founder Head of the department. Since its inception, the Department has shown a strong commitment towards research and teaching. In a short span of time, the Department established itself as Centres of Excellence for research in the areas of Biophysics, Nonlinear Dynamics and Crystallography. In recognition of the S. S. Bhatnagar’s prize (the nation’s highest pride for science) awarded to Prof. M. Lakshmanan (the former Head, and at present Professor of Eminence and SERB Distinguished Fellow) for his excellent contribution in the field of Nonlinear Dynamics at the international level, the University has created the Centre for Nonlinear Dynamics in the year 1990. The Department of Physics is under the umbrella of School of Physics since 2005. The Department of Physics is recognized by UGC-SAP (DRS-II), DST-FIST (level - I, Phase 2.0) and RUSA (R & I), Government of India.

In the course of time, the department has augmented its research horizon in other areas such as complex systems, Bose - Einstein condensation, Computational Physics, Nonlinear Resonances, Crystal Growth and Thin Films, Superconductivity, Magnetism, Nanoscience and Nanotechnology, Nonlinear Optics and Nano-Photonics. In order to expand the research in emerging areas, the university has created specialized research centres in high pressure studies, and nanoscience and nanotechnology within the Department of Physics in 2008. The Department has state of the art infrastructure for computational and experimental research facilities for conducting cutting edge research in both theoretical and experimental physics.

Besides good international reputation and excellence in research, the department is offering M.Sc and M.Phil programmes in Physics. The department also offers Ph.D programme in Physics, Materials Science and Nanotechnology to train young graduate students towards research in frontier topics.

Professor and Head
Objectives:

➢ To educate and training young and brighter minds of students with truly interdisciplinary skills that capable of leading future scientific advances in Indian academia and industries.

➢ To enable students to develop insights into the techniques used in current fields and allow comprehensive experience in frontier areas.

➢ Inculcate strong student competencies in Physics and its applications in a technology-rich, interactive environment through elective and value added skill based courses.

Vision and Mission:

Our vision and mission include,

➢ The continuous improvement of the quality of teaching, scientific research in theoretical and experimental physics.

➢ The development of innovative curricula and techniques based on research and the latest scientific discoveries.

➢ The national/international recognition of the Department, as well as the increasing impact on the development of socio-economic society as a whole.
**Publications:**

The **Department of Physics** has made major contributions in the areas of Nonlinear Dynamics, Biophysics, Crystallography, Thin Films, Crystal Growth, Nonlinear Optics Materials, Superconductivity, magnetism and nanomaterials and so on. The Faculty members have published more than 1300 research articles in Peer-Reviewed International Journals with overall citation of over 18000.

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<tr>
<th>Published Articles</th>
<th>Times Cited</th>
<th>H-Index</th>
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<td>All years</td>
<td>2013-2018</td>
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*Source: Web of Science (as on JANUARY 2019)*

**Research grant:**

**General Grant for Research and Teaching from Funding Agencies**

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<th>Sl.No</th>
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<th>Duration</th>
<th>Amount in Lakh (₹)</th>
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<td>1</td>
<td>DST-FIST- Level I Phase I</td>
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<td>UGC Infrastructure (Non-SAP)</td>
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<td>UGC-Infrastructure (DRS I)</td>
<td>2008-2009</td>
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<td>UGC-SAP-DRS-Phase II</td>
<td>2013-2018</td>
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<td>7</td>
<td>DST-FIST- Level I Phase III</td>
<td>2016-2021</td>
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<td>8</td>
<td>RUSA (R &amp; I)</td>
<td>2017-2019</td>
<td>150.00</td>
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</table>
Faculty Profile

Dr. K. JEGANATHAN
Professor & Head

Area of Research/Specialization:

➢ One-dimensional self-assembled nitride semiconductor (GaN, InN, AlN and its alloys, core-shell nanowires) nanostructures for LEDs, Solar cell and water splitting applications

➢ 2D layered materials (Graphene, MoS$_2$, WS$_2$, NbS$_2$, etc) for electronic, optoelectronic and energy harvesting devices

➢ Hybrid organic and inorganic Pervoskites for next generation photovoltaic applications

➢ Single Atom Catalyst functionalized semiconductor nanowires for Photo-electrochemical assisted water splitting

➢ Drug Delivery and SERS detection of biomolecules

Achievements made in Teaching/Research/Extension

No. of Research Publications : 116
No. of papers presented in Conferences : 54
h-index : 24
i-10 index : 55
Total Citations : 2024
Projects Completed/Ongoing : Completed -7, Ongoing-3
Consultancies Completed/Ongoing : Nano User Facility (NUF)

Awards and Recognitions

• TamilNadu Scientist Award (TANSA)-2017
• Fellow, The academy of Science, Chennai (2015)
• AvH-Germany – Equipment Subsidy award - 20,000 Euro (2016)
• DST- Nanomission – Major research grant (2009-2011)
• DST- Young Scientist (DST) - 2008
- **Alexander von Humboldt Fellowship (AvH)**, AvH Foundation, Germany (2006-2007)
- **Science Technology Agency (STA) award**, Govt. of Japan (2000-2002)
- **Young Student Award**, Abdus Salam International Center for Theoretical Physics, Trieste, Italy. (1998)
- Third world academy of Sciences, MASPEC-CNR, Parma, Italy (1998)

**Research Group Members**

**Research Scholars:**

1. Ms. R. Parameshwari
2. M. Gopalakrishnan
3. Ms. T.S. Sheena
4. Mr. S. Gopalakrishnan
5. Mr. N. Anbarasan
6. Mr. G. Paulraj
7. Mr. M. Mukilan
8. Ms. S. Abirami
9. Mr. A. Gunasekaran

**Post Doc Fellows:**

1. Dr. P. Manivel, UGC-Kotharai Fellow
2. Dr. S. Sadhasivam, UGC-Kotharai Fellow

**Past Members**

1. Dr. V. Purushothaman, Scientist, KAUST, Saudi Arabia
2. Dr. P. Sundara Venkatesh, Asst. Prof. SRNM College, Sattur
3. Dr. C. Gopalakrishnan, Head, Centre for Nanotechnology, SRM University, Chennai
4. Dr. P. Justin Jesuraj, Post Doc. Fellow, Korea University,
5. Dr. V. Rajiu, Post Doc. Fellow, Zhejiang university, China
6. Dr. P. Dharmaraj, Post Doc Fellow, KAUST, Saudi Arabia
Area of Research/Specialization:

1. Nonlinear Dynamics

Achievements made in Teaching/Research/Extension

- No. of Research Publications : 102
- No. of papers presented in Conferences : 07
- h-index : 24
- i-10 index : 44
- Total Citations : 2361
- Projects Completed/Ongoing : Completed -3

Awards and Recognitions


Past Members

1. V.M. Gandhimathi
2. V. Ravichandran
3. G. Sakthivel
4. S. Jeyakumari
5. S. Arathi
6. C. Jeevarathinam
7. S. Rajamani
8. K. Abirami
Area of Research/Specialization:
✓ Instrumentation on high pressure low temperature physics
✓ Transport magnetic and structural properties using Diamond anvil cell
✓ Instrumentation on ac-susceptibility, thermo power and specific heat measurements
✓ Materials synthesis under high pressure and high temperature
✓ Crystal growth by floating zone method
✓ Transport and magnetic properties of strongly correlated systems under extreme conditions of high pressure (50 GPa), low temperature (100 mK) and high magnetic field (18 T)

Achievements made in Teaching/Research/Extension

- No. of Research Publications: 130
- No. of papers presented in Conferences: 53
- h-index: 18
- i-10 index: 36
- Total Citations: 1203
- Patents Granted/Filed: 2
- Products Developed: 1
- Projects Completed/Ongoing: 18/2
- Consultancies Completed/Ongoing: --

Awards and Recognitions

Awards:
- Best Poster Presentation award, Indian Academy of Science, India (2018)
- MRSI Medal Lectures Award, Materials Research Society of India, India (2018).
- Tamil Nadu Scientist Award in Physical Sciences, Tamil Nadu State Council for Science and Technology, India (2014).
- Visiting Professorship, Institute of Solid State Physics, University of Tokyo, Japan

INSA Exchange Fellowship, DFG, Germany (2005).


Prof. M. A. Ittyachen Award, CTMS 2001, Mahatma Gandhi University, Kottayam, India (2001).


Young Scientist Fellowship, TSNCT, Chennai, Tamil Nadu, India (1996-1997).

Proficiency Prize award, A.V.V.M Sri Pushpam College, Thanjavur, India (1986).

Fellow in Academy of Sciences, Chennai.

**Recognitions:**

- Indian Society for Technical Education (1994)
- Magnetic Society of India
- Indian Association for Physics Teachers (1995)
- Indian Ceramic Society (1994)
- Materials Research Society of India (2013)
- Indian Society for Non-Destructive Testing
- Indian Physics Association (2017)
- Physical Society of Japan (1999 - 2000)
- Materials Research Society, USA (2016-17)
- The Indian Science Congress Association (2018).

**Research Group Members**

- Ms. N. Subbulakshmi
- Mr. K. Manikandan
- Mr. P. Sivaprakash
- Mr. M. Kannan
- Mr. C. Saravanan
- Mr. L. Govindaraj
- Mr. M. Sathiskumar
- Ms. R. Manimegalai
- Mr. S. Muthukumaran

**Past Members**

- Dr. G. Kalai Selvan
- Dr. U. Devarajan
- Dr. M. Kanagaraj
- Dr. R. Thiagarajan
- Dr. D. Mohan Radheep
• Dr. S. Esakki Muthu
• Dr. A. Murugeswari
• Dr. K. Mydeen
• Dr. N. Manivannan
• Dr. T. K. Madhubala
Area of Research/Specialization:

Condensed Matter Physics (Quantum Gases); Nonlinear Dynamics and Complex Systems; Computational Physics; Data analysis

Achievements made in Teaching/Research/Extension

- No. of Research Publications : 68
- No. of papers presented in Conferences : 6
- h-index : 21
- i-10 index : 35
- Total Citations : 1612
- Patents Granted/Filed : --
- Products Developed : --
- Projects Completed/Ongoing : 6/1
- Consultancies Completed/Ongoing : --

Awards and Recognitions

- Travel Grant (ITS) by DST-SERB, Govt. of India for attending 685. WE-Heraeus-Seminar on 'Research Frontiers in Ultracold Quantum Gases' at the Physikzentrum Bad Honnfe, Germany held during Dec 17-21, 2018.
- Travel Grant (ITS) by Department of Science & Technology, Govt. of India for attending International Seminar of Physics of Cold Atoms (Laser Physics 22) at Czech Technical University, Prague, Czech Republic held during Jul 14-19, 2013.
- Visiting Scientist Fellowship by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), São Paulo, Brazil (10 Nov 2010 – 9 Nov 2011).
- Post-doctoral Fellowship (PDF) by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), São Paulo, Brazil (2001 – 2002).
• Awarded Senior Research Fellowship (SRF) by the Council of Scientific and Industrial research (CSIR), India (1997).

Research Group Members

• Dr. S. Sabari
• Dr. T. Sriraman
• Mr. R. Ravisankar
• Ms. N. Rasha Shanaz
• Ms. R. Arulmozhi Devi

Past Members

• Dr. R. Kishor Kumar
• Dr. B. Akila
• Ms. S. Bhuvaneswari
Dr. R. Ramesh Babu  
Assistant Professor

Area of Research/Specialization:

1. Crystal growth and characterization  
2. Thin films  
3. Nanomaterials

Achievements made in Teaching/Research/Extension

- No. of Research Publications: 139  
- No. of papers presented in Conferences: 18  
- h-index: 22  
- i-10 index: 50  
- Total Citations: 1446  
- Projects Completed/Ongoing: 07

Awards and Recognitions

2. CERTIFICATE OF APPRECIATION presented by ACS Publications during December 2011 for valuable contribution and dedicated service in the peer review of manuscripts  
5. Tamil Nadu Young Scientist Fellowship Award (2008-2009), Tamil Nadu State council for Science and Technology, Tamil Nadu, India.  


**Research Group Members**

- Mr. M. Vadivel
- Mr. S. Raja
- Mr. P. A. Praveen
- Mr. K. Arjunan
- Ms. B. Noorul Ayin
- Mr. C. Saravanan

**Past Members**

- Dr. K. Sangeetha
- Dr. V. Vasudevan
- Dr. SP. Prabhakaran
- Dr. S. Renuka
- Dr. M. Sukumar
- Dr. P. Velusamy
- Dr. T. Indira Gandhi
Dr. T. C. SABARI GIRISUN  
Assistant Professor

Area of Research/Specialization:
Nanophotonics, Nonlinear optics and Solar Photovoltaics

Achievements made in Teaching/Research/Extension

- No. of Research Publications: 51
- No. of papers presented in Conferences: 15
- h-index: 13
- i-10 index: 15
- Total Citations: 527

Awards and Recognitions

- **Best Project Award** for “Extraction of Nanostructured Metal Oxides from the Industrial Waste (EOFD) for the Realization of Low Cost Solar Applications” from Tamilnadu Science and Technology under Students Project Scheme 2010-2011.
- **Travel Grant Award** for attending International Conference – ICMAT 2011 held at Singapore during June 25 – July 1, 2011 by DST-SERC, Government of India.
- **Best Researcher Award** of Bishop Heber College (2010-2011).
- Travel Grant Award for attending International Conference – ICB 2014 held at Dubai during 29th – 30th October 2014 by CICS, Government of Tamilnadu, India.
- Research article “Improved third-order optical nonlinearity and optical limiting behaviour of (nanospindle and nanosphere) zinc ferrite decorated reduced graphene oxide under continuous and ultrafast laser excitation, *RSC Advances, 6, 91083–91092 (2016)*” is selected as **Best Top-Cited Article in Editors collection- RSC Advances** for the period 2016-2018 from India.
Research Group Members

- Dr. N Siji Narendran
- Mrs. C. Babeela
- Mr. C. Jeganathan
- Ms. N. Priyadarashani
- Mr. M. Saravanan
- Mr. M. Durairaj
- Mr. M. Abith
Funded By
Fund Received Details (Rs. in Lakhs)

- **DST (SERB, FIST, Nanomission)**: (38.03) lakhs (7%)
- **UGC (MRP, SAP)**: (150) lakhs (12%)
- **DRDO + DMRL**: (124.71) lakhs (10%)
- **RUSA (R &I)**: (145.5) lakhs (12%)
- **CSIR**: (88) lakhs (3%)
- **DBT**: (676.15) lakhs (56%)
### Details of Fellowships being availed by the Research Scholars/Project Staff

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<th>Name</th>
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<td>Senthilkumar P</td>
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<td>Manikandan K</td>
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<td>Kannan M</td>
<td>34072</td>
<td>SRF - CSIR</td>
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<td>4.</td>
<td>Gopalakrishnan S</td>
<td>7430</td>
<td>UGC BSR-SRF</td>
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<td>5.</td>
<td>Ravi Sankar R</td>
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<td>Bhuvaneswari S</td>
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<td>Manimegalai D</td>
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<td>Dr. Manivel. P</td>
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<td>UGC- D.S.Kothari Post Doctoral Fellow</td>
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<td>Arjunan K</td>
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<td>Amreetha S</td>
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<td>Saravanan M</td>
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<td>Durairaj M</td>
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<td>Paulraj G</td>
<td>41027</td>
<td>DST-INSPIRE</td>
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<td>27.</td>
<td>Dr.S. Sadhasivam,</td>
<td>UGC-Kothari</td>
<td>UGC- D.S.Kothari Post Doctoral Fellow</td>
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<td>28.</td>
<td>A. Gunasekaran</td>
<td>44255</td>
<td>Project assistant Level-II, DST-Nanomission</td>
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<td>29.</td>
<td>S.Abirami</td>
<td>12867</td>
<td>RUSA</td>
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Citations in Each Year (Web of Science)

Sum of Times Cited: 18425
h-index: 55
Books/Book Chapters (2013-14 to 2017-18)


4. Moorthi Kanagaraj, Sonachalam Arumugam and Andrei Mourachkine,
   Pressure Effect on Novel Iron Based Superconductors, Horizons in World
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Conferences/Workshops/Seminars</th>
<th>Period</th>
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<tr>
<td>1.</td>
<td>Lecture Series on Photonics</td>
<td>20/02/2013</td>
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<td>2.</td>
<td>National Seminar on Recent Advances in Materials Science (RAMS-2014)</td>
<td>03/02/2014 - 04/02/2014</td>
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<td>National Science Day-2014</td>
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<td>4.</td>
<td>Workshop on Advances in Nanotechnology: Fabrication, Processing and Applications</td>
<td>28/02/2014 - 01/03/2014</td>
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<td>1st National conference on Nanophotonics</td>
<td>06/03/2014 - 07/03/2014</td>
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<td>6.</td>
<td>NMI Workshop on &quot;Nonlinear Integrable Systems and their Applications&quot;</td>
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<td>7.</td>
<td>International Workshop on Strongly Correlated Materials</td>
<td>20/01/2015</td>
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<td>10.</td>
<td>2nd National conference on Nanophotonics</td>
<td>18/03/2016 -- 19/03/2016</td>
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<td>UGC sponsored Refresher Course in Materials Science, by UGC Academic Staff College</td>
<td>02.11.2016 -- 22.11.2016</td>
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<td>12.</td>
<td>UGC sponsored Refresher Course in Physics, by UGC Academic Staff College</td>
<td>17.02.2016 -- 08.03.2016</td>
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<td>15.</td>
<td>Indo-French International Workshop - Pressure Effects on Strongly Correlated Materials</td>
<td>09/01/2017-- 12/01/2017</td>
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<td>16.</td>
<td>MRSI-Trichy Chapter Inauguration</td>
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<td>17.</td>
<td>National science day 2017</td>
<td>28/02/2017</td>
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<td>18.</td>
<td>GIAN course on complexes systems : Modelling and Analysis (CSMA)</td>
<td>11/12/2017 -- 15/12/2017</td>
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<td>19.</td>
<td>Department Open Day (APEIRON - 2018)</td>
<td>07/02/2018</td>
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<td>20.</td>
<td>Asia-Pacific Academy of Materials (APAM) Special Lecture Series</td>
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<tr>
<td>22.</td>
<td>UGC sponsored Refresher Course in Physics conducted by UGC Academic Staff College, Bharathidasan University, Tiruchirappalli</td>
<td>February-March 2016</td>
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<td>23.</td>
<td>One day Seminar on Nobel Prize Topics Gravitational Waves, Physics-2017</td>
<td>25.04.2018</td>
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<td>24.</td>
<td>National science day 2018</td>
<td>28.02.2018</td>
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<td>25.</td>
<td>BUDS THINK - Nobel Prize Talk on Gravitational waves</td>
<td>25.05.2018</td>
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<td>27.</td>
<td>International Week of Science and Peace 2018 (Role of Science on the way to Green Societies)</td>
<td>14.11.2018</td>
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<td>28.</td>
<td>International Conference on Sustainable Energy Technologies (i-SET 2018)</td>
<td>27.06.2018 – 28.06.2018</td>
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</table>
Programmes offered

1. M.Sc. Physics
2. M.Phil. Physics
3. Ph.D. Physics, Ph.D Nanotechnology and Ph.D Materials Science

Program objectives

The major objective of the programme is to nurture the students for careers in teaching, research, etc. It also aims to develop thorough and in-depth knowledge of various core subjects in Physics such as Mathematical Physics, Electronics, Quantum Mechanics, Nuclear Physics, Condensed Matter Physics, Classical Mechanics, Electromagnetic theory, Atomic and Molecular physics, etc. The M.Sc. Physics programme will also inculcate strong student competencies in Physics and its applications in a technology-rich, interactive environment through elective and value added skill based courses.

➢ M.Sc. (Physics) - Two Year

The Department of Physics is offering a two year M.Sc. Programme. The eligibility for admission to M.Sc. Programme is B.Sc. degree Physics with Mathematics as one of the allied/ancillary courses and with a minimum 55% marks or 5.5 CGPA. Admission is conducted through open advertisements (during April/May) by the University and students are selected through an entrance test by the Department of Physics.

➢ M.Phil. (Physics) - One Year

The Department of Physics offers a one year full-time M. Phil. programme for students who have motivation for research. The eligibility for admission to M. Phil. Programme is M.Sc. Physics degree with minimum 60% (First Class) marks or 6.0 CGPA. Admission is conducted through open advertisements (during May/June) by the University and students are selected through a written test by the Department of Physics. For more details refer, (http://www.bdu.ac.in/admissions/mphil-admissions.php).

Department of Non-linear Dynamics, School of Physics is an academic partner in offering M.Sc. and M.Phil. Physics programme.

➢ Ph.D. (Research Programme)

The Department of Physics is offering Ph. D. programme in frontier topics in the areas of Nonlinear Phenomena and Complex Systems, Bose-Einstein Condensation, Nonlinear Resonances, Crystal Growth and Thin Films, Nanoscience and Nanotechnology, Nonlinear Optics, Nano-Photonics, Superconductivity and Magnetism. The eligibility for admission to Ph.D. Programme is M.Sc. Physics degree with minimum 60% (First Class) marks or equivalence. Candidates interested in pursuing Ph.D. programme (Full-time or Part-time) in the Department of Physics must qualify the Pre-Registration Qualifying Entrance Examination (Written test) conducted by the University. However, the candidates, who have qualified M.Phil./UGC-CSIR/SET examinations, working in the sponsored research projects,
and FIP and teacher candidates are exempted from the qualifying entrance examination. Students are free to select their guides and the research field through personal interaction with the faculty members. NET, GATE, JEST or equivalent qualified candidates are preferred in admission. For more details refer university regulations for admission to Ph.D. programmes (http://www.bdu.ac.in/research/phd-admissions.php).

**Selection Procedure**

Selection shall be made on the basis of merit list prepared from the written test and admitted as per Government regulations.
## Students’ achievements (2013-14 to 2017-18)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Reg. No.</th>
<th>Name</th>
<th>Exam(s) Qualified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2K12PH06</td>
<td>Jananiy M</td>
<td>GATE</td>
</tr>
<tr>
<td>2.</td>
<td>2K12PH09</td>
<td>Mohamed Sathi Batcha A</td>
<td>TRB</td>
</tr>
<tr>
<td>3.</td>
<td>2K12PH16</td>
<td>Ramesh G</td>
<td>TRB</td>
</tr>
<tr>
<td>4.</td>
<td>2K12PH26</td>
<td>Vaiyanthi R</td>
<td>Group II (TNPSC)</td>
</tr>
<tr>
<td>5.</td>
<td>2K15PH11</td>
<td>Hemalatha V</td>
<td>GATE</td>
</tr>
<tr>
<td>6.</td>
<td>2K15PH18</td>
<td>Kesavaraja C</td>
<td>JEST, SLET</td>
</tr>
<tr>
<td>7.</td>
<td>2K15PH36</td>
<td>Thirunvukkarasu K</td>
<td>JEST, NET</td>
</tr>
<tr>
<td>8.</td>
<td>2K15PH40</td>
<td>Vignesh Balaji K</td>
<td>SLET</td>
</tr>
<tr>
<td>9.</td>
<td>2K12PH02</td>
<td>Binu Joy</td>
<td>University Rank - I</td>
</tr>
<tr>
<td>10.</td>
<td>2K13PH02</td>
<td>Archana G Shenoy</td>
<td>University Rank - I</td>
</tr>
<tr>
<td>11.</td>
<td>2K14PH18</td>
<td>Sudharsan S</td>
<td>University Rank - I</td>
</tr>
<tr>
<td>12.</td>
<td>2K15PH06</td>
<td>Calvinshijo M</td>
<td>University Rank - I</td>
</tr>
<tr>
<td>13.</td>
<td>2K16PH03</td>
<td>Abith M</td>
<td>University Rank - II</td>
</tr>
</tbody>
</table>

## Awards Received by students/scholars

<table>
<thead>
<tr>
<th>Year</th>
<th>Name of the Awarded Students</th>
<th>National Awards</th>
<th>Awarding Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Purushothaman. V</td>
<td>Partial Travel Grant to participate in International conference on Materials for Advanced Technologies, Singapore, Internationa Travel support scheme (ITS)</td>
<td>DST-SERB- India</td>
</tr>
<tr>
<td>2013</td>
<td>Goplakrishnan. M</td>
<td>Second International Workshop on Advanced Functional Nanomaterials, Best Poster Award</td>
<td>Anna University, Chennai</td>
</tr>
<tr>
<td>2014</td>
<td>P. A. Praveen</td>
<td>Best Oral Presentation</td>
<td>The MS University of Baroda, Vadodara, Gujarat.</td>
</tr>
<tr>
<td>2014-2018</td>
<td>M. Vadivel</td>
<td>UGC- BSR JRF</td>
<td>UGC</td>
</tr>
<tr>
<td>Year</td>
<td>Name</td>
<td>Title/Position/Grant</td>
<td>Institution/Location</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------</td>
<td>----------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>2014</td>
<td>Parameshwari. R</td>
<td>Senior Research Fellow, DST-INSPIRE SRF</td>
<td>DST, India</td>
</tr>
<tr>
<td>2014</td>
<td>Justin Jesuraj. P</td>
<td>Senior Research Fellow, CSIR SRF</td>
<td>CSIR, Govt of INDIA</td>
</tr>
<tr>
<td>2014</td>
<td>Parameshwari. R</td>
<td>Travel Grant to participate in GRAPHENE-2014-, DST-SERB-ITS Grant</td>
<td>DST, India</td>
</tr>
<tr>
<td>2015</td>
<td>Parameshwari. R</td>
<td>Newton-Bhabha Ph.D exchange programme</td>
<td>DST, India &amp; British Council, United Kingdom</td>
</tr>
<tr>
<td>2015</td>
<td>Dharmaraj. P</td>
<td>Senior Research Fellow, CSIR SRF</td>
<td>CSIR, Govt of INDIA</td>
</tr>
<tr>
<td>2015</td>
<td>Gopakrishnan. M</td>
<td>Partial Travel Grant to participate in 11th International conference on nitrite semiconductor Beijing China, Internationa Travel support scheme (ITS)</td>
<td>DST-SERB- India CSIR- India</td>
</tr>
<tr>
<td>2015</td>
<td>Dharmaraj. P</td>
<td>Senior Research Fellow, CSIR SRF</td>
<td>CSIR, Govt of INDIA</td>
</tr>
<tr>
<td>2015-2018</td>
<td>P. A. Praveen</td>
<td>UGC- BSR JRF</td>
<td>UGC</td>
</tr>
<tr>
<td>2016</td>
<td>P. A. Praveen</td>
<td>Best Oral Presentation Award</td>
<td>KSR college of Arts and Science for Women, Tiruchengode, Tamilnadu.</td>
</tr>
<tr>
<td>2016</td>
<td>Saravanan. M</td>
<td>Best Poster</td>
<td>Periyar University, Salem</td>
</tr>
<tr>
<td>2016</td>
<td>Priyadarshani. N</td>
<td>Best Oral Presentation Award</td>
<td>National level seminar on advances in material science (NLSAMS-2016), Jairams arts and science college, Karur, Tamil Nadu.</td>
</tr>
<tr>
<td>2016</td>
<td>Dharmaraj. P</td>
<td>Visiting Student</td>
<td>King Abdulla University of Science and Technology, Saudi Arabia</td>
</tr>
<tr>
<td>2017</td>
<td>Manikandan. M</td>
<td>Best Poster</td>
<td>Visvesvaraya Technology University</td>
</tr>
<tr>
<td>2017</td>
<td>Senthilkumar. P</td>
<td>Best Oral Presentation Award</td>
<td>Madurai Kamaraj University, Madurai.</td>
</tr>
<tr>
<td>Year</td>
<td>Name</td>
<td>Award</td>
<td>Institution</td>
</tr>
<tr>
<td>------</td>
<td>---------------</td>
<td>--------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>2017</td>
<td>P. A. Praveen</td>
<td>Best Oral Presentation Award</td>
<td>National College, Trichy.</td>
</tr>
<tr>
<td>2017</td>
<td>Paulraj. G</td>
<td>Best paper Award</td>
<td>University of Madras, Chennai.</td>
</tr>
<tr>
<td>2017</td>
<td>Paulraj. G</td>
<td>DST-Inspire, Junior Research Fellow</td>
<td>DST, India</td>
</tr>
<tr>
<td>2017</td>
<td>Parameshwari. R</td>
<td>Runnerup in Newton Prize – 2017 held at Delhi</td>
<td>DST, India &amp; British Council, United Kingdom</td>
</tr>
<tr>
<td>2016</td>
<td>K. Manikandan</td>
<td>Rajiv Gandhi Fellowship</td>
<td>UGC</td>
</tr>
<tr>
<td>2017</td>
<td>K. Manikandan</td>
<td>Rajiv Gandhi Fellowship(SRF)</td>
<td>UGC</td>
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<tr>
<td>2017</td>
<td>P. SivaPrakash</td>
<td>UGC-SAP (SRF)</td>
<td>UGC</td>
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<tr>
<td>2018</td>
<td>M. Kannan</td>
<td>CSIR-SRF</td>
<td>CSIR</td>
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<tr>
<td>2018</td>
<td>D. Manimegalai</td>
<td>URF</td>
<td>BDU</td>
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<tr>
<td>2018</td>
<td>L. Govindaraj</td>
<td>Best Poster Award</td>
<td>MRSI- Trichy Chapter</td>
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<tr>
<td>2018</td>
<td>P. SivaPrakash</td>
<td>Best Student Project Proposal</td>
<td>MRSI- Trichy Chapter</td>
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<tr>
<td>2018</td>
<td>M. Kannan</td>
<td>Best Student Project Proposal</td>
<td>MRSI- Trichy Chapter</td>
</tr>
<tr>
<td>2018</td>
<td>Paulraj G</td>
<td>DST – INSPIRE</td>
<td>DST</td>
</tr>
</tbody>
</table>
### Foreign PDF received by scholars (2013-2018)

<table>
<thead>
<tr>
<th>Name of the scholar</th>
<th>Awarding institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. G. Kalai Selvan</td>
<td>University of Alabama Birmingham (UAB)</td>
</tr>
<tr>
<td>Dr. M. Kanagaraj</td>
<td>China</td>
</tr>
<tr>
<td>Dr. R. Thiyagarajan</td>
<td>Institute of Solid State and Materials Physics (IFMP), TU Dresden, 01069 Dresden, Germany.</td>
</tr>
<tr>
<td>Dr. V. Purushothaman</td>
<td>Nanoenergy Lab&lt;br&gt;King Abdullah University of Science and Technology (KAUST) Saudi Arabia.</td>
</tr>
<tr>
<td>Dr. P. Justin Jesuraj</td>
<td>Division of Display and Semiconductor Physics, College of Science and Technology, Korea University</td>
</tr>
<tr>
<td>Dr. P. Dharmaraj</td>
<td>King Abdullah University of Science and Technology (KAUST) Saudi Arabia.</td>
</tr>
<tr>
<td>Dr. P. Velusamy</td>
<td>College of Chemistry and Chemical Engineering, Henan University, kaifung-475004, Henan province, P.R. China.</td>
</tr>
<tr>
<td>Dr. R. Kishor Kumar</td>
<td>University of São Paulo, Brazil</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ph. D. Awardees</th>
<th>M. Sc. Gold Medalists</th>
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<tbody>
<tr>
<td><strong>Name</strong></td>
<td><strong>Year of passing</strong></td>
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<tr>
<td>Vasudevan V</td>
<td>2013-14</td>
</tr>
<tr>
<td>Kishor Kumar R</td>
<td>2013-14</td>
</tr>
<tr>
<td>Mohan Radheep D</td>
<td>2013-14</td>
</tr>
<tr>
<td>Sundara Venkatesh P</td>
<td>2013-14</td>
</tr>
<tr>
<td>Arathi S</td>
<td>2014-15</td>
</tr>
<tr>
<td>Purushothaman V</td>
<td>2014-15</td>
</tr>
<tr>
<td>Thiyagarajan R</td>
<td>2014-15</td>
</tr>
<tr>
<td>Prabhakaran SP</td>
<td>2014-15</td>
</tr>
<tr>
<td>Subashini A</td>
<td>2014-15</td>
</tr>
<tr>
<td>Kanagaraj M</td>
<td>2014-15</td>
</tr>
<tr>
<td>Mohandoss R</td>
<td>2014-15</td>
</tr>
<tr>
<td>Jothi L</td>
<td>2014-15</td>
</tr>
<tr>
<td>Gopalakrishnan C</td>
<td>2015-16</td>
</tr>
<tr>
<td>Jeevarathinam C</td>
<td>2015-16</td>
</tr>
<tr>
<td>Renuka N</td>
<td>2015-16</td>
</tr>
<tr>
<td>Devarajan U</td>
<td>2016-17</td>
</tr>
<tr>
<td>Sivagami R</td>
<td>2016-17</td>
</tr>
<tr>
<td>Rajeswari P</td>
<td>2016-17</td>
</tr>
<tr>
<td>Name</td>
<td>Years</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Kalai Selvan G</td>
<td>2016-17</td>
</tr>
<tr>
<td>Rajamani S</td>
<td>2016-17</td>
</tr>
<tr>
<td>Justin Jesuraj P</td>
<td>2017-18</td>
</tr>
<tr>
<td>Abirami K</td>
<td>2017-18</td>
</tr>
<tr>
<td>Sukumar M</td>
<td>2017-18</td>
</tr>
<tr>
<td>Akila B</td>
<td>2017-18</td>
</tr>
<tr>
<td>Velusamy P</td>
<td>2017-18</td>
</tr>
<tr>
<td>Bhuvaneswari P.V</td>
<td>2017-18</td>
</tr>
<tr>
<td>Sriraman T</td>
<td>2018-19</td>
</tr>
<tr>
<td>Dharmaraj P</td>
<td>2018-19</td>
</tr>
<tr>
<td>Rajiu V</td>
<td>2018-19</td>
</tr>
<tr>
<td>Nisha Francis P</td>
<td>2018-19</td>
</tr>
<tr>
<td>Indira Gandhi T</td>
<td>2018-19</td>
</tr>
</tbody>
</table>
Facilities

- High Resolution Scanning Electron Microscope
- Atomic Force Microscope
- Dynamic Light Scattering (DLS) - Particle size & Zeta potential analyzer
- InVia Raman Microscope
- RF/DC Magnetron Sputtering Unit with Chiller
- E-beam evaporation Unit
Room and Low temperature Photoluminescence with the excitation of 325 nm (He-Cd) Laser

Thermal Chemical Vapor Deposition – III-Nitrides

Thermal Evaporation with Glove Box

III Zone Hydride chemical Vapor Epitaxy

Probe Station & Keithely Set Up

Chemical Vapor Deposition – 2D Materials TMDs
Thermal Chemical Vapor Deposition – Graphene

RTA furnace

Solar Simulator

Table Top Sputter Coater
Gas Chromatography (GC)

Potentiostat Biologic SP150

PPMS - VSM (2K-400K 9T)

Cryogen free CCR- VTI (4K – 800K)

Powder – X Ray Diffractometer

Electric Discharge Drilling Machine (Hylozoic Products, USA)
Ruby pressure calibration setup with industrial microscope

DAC sample mounting microscope (Meiji Techno, Japan)

B2901A Precisien Source/Measure Unit

34420A Nano Volt meter

2401 Source meter

4263B LCR Meter

SR860 DSP Lock-In Amplifier

331 Temperature Controller

CNC Lathe (Tutor, ACE, Bangalore)

100Ton (LYXN, Lawrence & Mayo) and 20 Ton (Riken Kiki, Japan), hydraulic press
<table>
<thead>
<tr>
<th>High Temperature Czochralski Crystal growth unit</th>
<th>20 KVA UPS</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="High Temperature Czochralski Crystal growth unit" /></td>
<td><img src="image2.jpg" alt="20 KVA UPS" /></td>
</tr>
<tr>
<td>Constant temperature water bath unit</td>
<td>Constant temperature water bath with cryostat</td>
</tr>
<tr>
<td><img src="image3.jpg" alt="Constant temperature water bath unit" /></td>
<td><img src="image4.jpg" alt="Constant temperature water bath with cryostat" /></td>
</tr>
</tbody>
</table>

**Vacuum Tubular furnace (VB Ceramics, Chennai)**

**Vacuum Tubular furnace (Technicho, Chennai)**
<table>
<thead>
<tr>
<th>Equipment</th>
<th>Image</th>
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</thead>
<tbody>
<tr>
<td>Electron beam /Thermal evaporation unit</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>Hall Measurement setup</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>Glove Box</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>Hydraulic press pelletizer</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>Nano stepper motor for crystal puller unit</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>Polarizing Optical Microscope</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>Spin Coating unit</td>
<td>Thickness Profilometer</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td><img src="image1.png" alt="Spin Coating unit" /></td>
<td><img src="image2.png" alt="Thickness Profilometer" /></td>
</tr>
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<table>
<thead>
<tr>
<th>Uv-Ozon unit</th>
<th>Top seeded solution growth unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Uv-Ozon unit" /></td>
<td><img src="image4.png" alt="Top seeded solution growth unit" /></td>
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<table>
<thead>
<tr>
<th>Hioki-LCR Meter</th>
<th>Vertical dynamic gradient freeze technique</th>
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</thead>
<tbody>
<tr>
<td><img src="image5.png" alt="Hioki-LCR Meter" /></td>
<td><img src="image6.png" alt="Vertical dynamic gradient freeze technique" /></td>
</tr>
</tbody>
</table>
I-V characteristic unit  Organic Molecular evaporator

Q-Switched nanosecond Nd:YAG, 1064 nm, 532 nm Laser with Z-scan setup  Langmuir-Blodgett Thin film coating unit
Conferences, Seminars and Workshop Organised

International Conference i-SET 2018 conducted by Department of Physics, Bharathidasan University.
National Seminar on Recent Advances in Material Science (RAMS-2014, 3-4, Feb 2014)
Inauguration ceremony of National Conference on Nanophotonics (NCNP-2014) on 6-7 March, 2014

Inauguration ceremony of National Conference on Nanophotonics (NCNP-2014) on 18-19 March, 2016

GIAN-2018
Crystal growth of Functional and Exotic Materials

MRSI 2018
MRSI National Symposium - Advances In Functional And Exotic Materials, February 14-16, 2018

Asia Pacific Academy of Materials-Lecture Series, February 13, 2018

Indo-French International Workshop - Pressure Effects on Strongly Correlated Materials, January 9-12, 2017


GMW For Young Scientists in Physical and Mathematical Sciences

Departmental Activities

APEIRON

APEIRON Events
Dr. K. JEGANATHAN
Professor and Head
Department of Physics
Bharathidasan University
Tiruchirappalli - 620 024
Tamil Nadu, India
Tel: +91 431 – 2407057
E-Mail: phy@bdu.ac.in
Web: www.bdu.ac.in
## Appendix I

### Research & Consultancy Projects

#### Completed Projects

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Title of the Project (Investigator)</th>
<th>Agency</th>
<th>Duration</th>
<th>Amount in Lakh (₹)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>UGC-SAP LEVEL I</td>
<td>UGC</td>
<td>2007-2012</td>
<td>47.00</td>
</tr>
<tr>
<td>2</td>
<td>Electronic Transport and Magnetic Studies in Heusler type Co-Fe-Si Alloy thin films at Low Temperature and High Magnetic Field. <em>(Dr. S. Arumugam)</em></td>
<td>DMRL-CARS</td>
<td>2012-2013</td>
<td>10.00</td>
</tr>
<tr>
<td>3</td>
<td>Hydrostatic Pressure Effect on Manganites Single Crystals under High Pressure Low Temperature. <em>(Dr. S. Arumugam)</em></td>
<td>UGC</td>
<td>2011-2014</td>
<td>3.50</td>
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<tr>
<td>4</td>
<td>Development of Uniaxial Pressure and Modified Bridgman Anvil Devices for Transport and Magnetic Measurements. <em>(Dr. S. Arumugam)</em></td>
<td>DST</td>
<td>2012-2014</td>
<td>60.00</td>
</tr>
<tr>
<td>5</td>
<td>Pressure Effect on the Properties of Organic Conductors and Pnictides Superconductors. <em>(Dr. S. Arumugam)</em></td>
<td>DST-JSPS</td>
<td>2012-2014</td>
<td>5.74</td>
</tr>
<tr>
<td>6</td>
<td>Development of Bridgman Anvil Pressure Cell for Electrical Resistivity and Thermoelectric Power Measurement and Investigation of Half Heusler Alloys. <em>(Dr. S. Arumugam)</em></td>
<td>DAE-BRNS</td>
<td>2012-2015</td>
<td>30.00</td>
</tr>
<tr>
<td>7</td>
<td>Synthesis, Characterization and Investigation of Heusler Alloys Based Magnetocaloric Materials at Extreme Conditions of Pressure, Temperature and Magnetic Field. <em>(Dr. S. Arumugam)</em></td>
<td>DRDO</td>
<td>2013-2016</td>
<td>54.00</td>
</tr>
<tr>
<td>8</td>
<td>Transport properties of Fe-based Superconductors under Extreme Conditions of High Pressure, Low Temperature and High Magnetic Field. <em>(Dr. S. Arumugam)</em></td>
<td>DST-SERB</td>
<td>2013-2016</td>
<td>21.80</td>
</tr>
<tr>
<td>9</td>
<td>Pressure Effect on Magnetic and Transport Properties of Highly Anisotropic Systems Spin Ladder and Decagonal Quasicrystalline Single Crystals. <em>(Dr. S. Arumugam)</em></td>
<td>DST-Indo-Russia</td>
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<td>10</td>
<td>InGaN/GaN Nanowire based Solar cell <em>(Dr. K. Jeganathan)</em></td>
<td>AvH-Germany</td>
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<td>Vertically aligned ZnO nanowires on p-type GaN for UV-Visible light emitting diode (LED) applications (Dr. K. Jeganathan)</td>
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<td>Investigation on the Mechanism, Efficacy and Genotoxic Risk of Gold Nanoparticles: Application in Photothermal Mediated Anticancer Therapy (Co-PI: Dr. K. Jeganathan)</td>
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<td>Fabrication and Characterization of Self-assembled 1D Semiconductor Nanostructures (Dr. K. Jeganathan)</td>
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<td>14</td>
<td>Matter Wave Solitons in Multicomponent and Dipolar Bose-Einstein Condensates (Dr. P. Muruganandam)</td>
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<td>Study on the Dynamics of Dipolar Condensates from the Numerical Simulations of Gross-Pitaevskii Equation (Dr. P. Muruganandam)</td>
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<td>16</td>
<td>Fabrication and performance study of spray deposited low bandgap organic polymers and fullerene blend based solar cell devices (Dr. R. Ramesh Babu)</td>
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<td>Top seeded solution growth of KNbO3 single crystals for nonlinear optical applications (Dr. R. Ramesh Babu)</td>
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## Ongoing Projects

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<td>III- Nitride semiconductor core-shell nanowire for next generation photovoltaic applications (Dr. K. Jeganathan)</td>
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<td>Sustainable Energy Technologies - Investigation on the advanced functional materials for the next generation solar cell applications (Dr. K. Jeganathan, Dr. S. Arumugam, Dr. R. Ramesh Babu and Dr. T. C. Sabari Girisun)</td>
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<td>Matter wave bright and vortex solitons in spin-orbit coupled Bose-Einstein condensates (Dr. P. Muruganandam)</td>
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<td>Fabrication of Channelized Electron Transport Photo Electrodes for Bio Sensitized Solar Cells (Dr. T. C. Sabari Girisun)</td>
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<td>Nanocomposite rGO/BBO thin films for human eye and photo-sensitive components protection from intense laser radiations (Dr. T. C. Sabari Girisun)</td>
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<td>Synthesis and characterization of Magnetocalaoric studies of Hesusler alloys at extreme conditions of pressure (Dr. S. Arumugam)</td>
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<td>Study on the properties of Rashba condensates spin orbit coupled BE in 2 and 3 dimensions (Dr. P. Muruganandam)</td>
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<td>Synthesis and physical properties of new superconductors using high-pressure technique (Dr. S. Arumugam)</td>
<td>DST-JSPS</td>
<td>2018-2020</td>
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Appendix II

List of Research Publications since 2013-14


12. S. Sadhasivam, P. Manivel, K. Jeganathan, C. K. Jayasankar, N. P. Rajesh, (2017), Bright blue cooperative upconversion emission of Yb$^{3+}$ from langbeinite $K_2Ti_{1.887}Yb_{0.113}(PO_4)_3$ single crystal, Materials Letters, 188, 399-402.


25. V. Purushothaman, P. Sundara Venkatesh, R. Navamathavan and K. Jeganathan (2014), *Direct comparison on the structural and optical properties of metal-catalytic and self catalytic assisted gallium nitride (GaN) nanowires by chemical vapor deposition*, *RSC Advances* 4, 45100.


97. ThiyagarajanDhandayuthapani, MadhusoodhananpillaiGirish, SivakumarRengasamy, Sanjeeviraja, C. Gopalakrishnan, C. Nagarajan, Ragavendran Mathew, Sinu Ding, Jun,

98. C. Saravanan, R. Thiyagarajan, K. Manikandan, M. Sathiskumar, P. V. Kanjariya, J. A. Bhalodia and S. Arumugam, (2017), “Effect of Cd doping on magnetocaloric effect and critical behavior analysis on perovskite Nd_{1-x}Cd_{x}MnO_{3} (x 5 0, 0.1, 0.2, 0.3, and 0.4) manganite polycrystals”, J. Appl. Phys. 122 245109.


100. Zeba Haque, Gohil Thakur, Ganesan Kalai Selvan; Theresa Block, Oliver Janka, Rainer Pöttgen, Amish Joshi, Rangasamy Parthasarathy, Sonachalam Arumugam, Laxmi Gupta and Ashok Kumar Ganguli, (2017), “Valence state of Eu and superconductivity in Se-substituted EuSr_{2}Bi_{2}S_{4}F_{4} and Eu_{2}SrBi_{2}S_{4}F_{4}”, Inorg. Chem., DOI: 10.1021/acs.inorgchem.7b01555.


110. R. Thiyagarajan, S. Arumugam, P. Sivaprakash, C. Saravanan, and Wenge Yang, (2017), “Effect of Hydrostatic Pressure on spin reorientation transition in ferromagnetic Sm$_{0.7-x}$La$_x$Sr$_{0.3}$MnO$_3$ (x = 0, 0.1) Polycrystals”, J. Appl. Phys., 121, 215902.


113. S. Arumugam, R. Thiyagarajan G. KalaiSelvan and P. Sivaprakash, “Pressure Induced Insulator-Metal Transition and Giant Negative Piezoresistance in Pr$_{0.6}$Ca$_{0.4}$Mn$_{0.96}$Al$_{0.04}$O$_3$poly-crystal”, J. Magn. Magn. Mater., 417, 69 (2016).


116. KalaiSelvan G. Thakur, Gohil K. Manikandan, Banerjee Aloke, Haque Zeba, Laxmi Chand Gupta, Ganguli Ashok, and Arumugam Sonachalam, (2016), “Superconductivity in La$_{1.5}$Sm$_{0.5}$O$_{0.5}$F$_{0.5}$Bi$_2$ (x = 0.2, 0.8) under hydrostatic pressure”, J. Phys. D: Appl. Phys., 49, 275002.


120. R. Thiyagarajan, S. Esakki Muthu, G. Kalai Selvan, R. Mahendiran and S. Arumugam, (2015), “Critical behavior of resistivity in the pressure-induced first to second order transition in Pr0.6Ca0.4Mn0.96B0.04O3 (B=Co and Cr) polycrystals”, J. Alloys. Compds., 618, 159.


123. Gohil Thakur, G. Kalai Selvan, Haque Zeba, Laxmi Chand Gupta, Saroj Samal, S. Arumugam, and Ashok Ganguli, (2015), “Synthesis and properties of SmO0.5F0.5BiS2 and enhancement in Tc in La1-xSmxO0.5F0.5BiS2”, Inorg. Chem., 54, 1076.


125. R. Thiyagarajan, R. Mahendiran and S. Arumugam, “Critical behavior of resistivity in the pressure-induced first to second order transition in Pr0.6Ca0.4Mn0.96B0.04O3 (B=Co and Cr) polycrystals”, AIP. Conf. Proc., 1665 030013 (2015).


132. D. Mohan Radheep, P. Sarkar, S. Arumugam, R. Suryanarayanan, and P. Mandal, (2014), “Critical end point of the first-order ferromagnetic transition in a $\text{Sm}_{0.55}(\text{Sr}_{0.5}\text{Ca}_{0.5})_{0.45}\text{MnO}_3$ single crystal”, J. Magn. Magn. Mater., 365, 5.


139. R. Thiyagarajan, S. EsakkiMuthu, R. Mahendiran,and S. Arumugam, (2014), “Effect of hydrostatic pressure on magnetic and magnetocaloric properties of Mn-Site doped PerovskiteManganites $\text{Pr}_{0.6}\text{Ca}_{0.4}\text{Mn}_{0.96}\text{B}_{0.04}\text{O}_3$ (B = Co and Cr)”, J. Appl. Phys.,115, 043905.


146. U. Devarajan, S. EsakkiMuthu, S. Arumugam, Sanjay Singh, Sudipta Roy Barman, “Investigation of hydrostatic pressure on the magnetic and magnetocaloric properties of Ni$_{2-x}$Mn$_{1+x}$Ga (X = 0, 0.15) Heusler alloys”, J. Appl. Phys., 114, 053906 (2013).


150. D. Mohan Radheep, S. Arumugam, P. Sarkar, and P. Mandal, (2013), “Colossal piezoresistance effect in Sm$_{0.55}$(Sr$_{0.5}$Ca$_{0.5}$)$_{0.48}$MnO$_3$ single crystal”, Appl. Phys. Lett., 102, 092406.

151. SonachalamArumugam, D. Mohan Radheep, P. Sarkar, P. Mandal, (2013), “Uniaxial pressure effect of Metal-Insulator Transition (TMI) in oriented Sm$_{0.55}$(Sr$_{0.5}$Ca$_{0.5}$)$_{0.48}$MnO$_3$” Bull. Amer. Phy. Society (AIRAPT), 58, 7.


174. S Raja, M Vadivel, R Ramesh Babu, LS Kumar, K Ramamurthi, (2018), Ferromagnetic and dielectric properties of lead free KNbO$_3$-CoFe$_2$O$_4$ Composites, Solid State Sciences 85, 60-69.


202. M Vadivel, R Ramesh Babu, K Ramamurthi, M Arivanandhan, (2016), CTAB cationic surfactant assisted synthesis of CoFe$_2$O$_4$ magnetic nanoparticles, Ceramics International 42 (16), 19320-19328


225. SP. Prabhakaran, R. Ramesh Babu, G. Bhagavannarayana, K. Ramamurthi (2014), *Studies on Bulk growth, Structural and Microstructural Characterization of 4-


### Appendix III

**Programme Structure**

**Programme Code: 2PSPHY**

#### SEMESTER – I

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Total minimum credits required for completing M.Sc. Programme in Physics is 90.
Course Code: PHABC, PH - specifies Discipline / subject; A-semester, B : 0 Core, 1: Lab, 2: Elective, 3: value added, 4 MOOC course and C - course number

**Elective Courses**  
*(Choose one of the Elective courses in each semester)*

- **Elective I**  
  Computational Methods  
  Quantum computing

- **Elective II**  
  Atomic and Molecular Physics  
  Radiation Physics

- **Elective III**  
  Nanophysics  
  Thin film Technology

- **Elective IV**  
  Non-linear dynamics  
  Classical and Quantum Fields

**Value added courses**
- Stress management and personality development  
- Python Programming  
- Machine tools training  
- Computer Aided Drafting and Glass Blowing Practice  
- Analytical Equipments - Skill Development  
- Energy storage and devices  
- Clean and Green Energy  
- Symbolic Computations  
- Real Time Data Acquisition  
- Complex System Modeling and Analyses

**MOOC courses**
Students can register one of the online free courses, MOOCs in each semester to earn extra credit (2) and same will be transferred on the submission of course certificate.
Distribution of Marks

**A. THEORY**

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**B. LABORATORY**

1. Continuous Internal Assessment
   - Average of Marks Awarded in the Record Note Book for the Experiments done during Regular Laboratory Hours : 40 Marks

2. **Final Comprehensive Examination**
   - For the Experiment carried out during the Final Examination : 40 Marks
   - Viva-voce Examination : 20 Marks
   - **Total** : 100 Marks
   - Minimum Total Marks Required for Earning the Credits : 50 Marks

**C. PROJECT**

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Centre for High Pressure Research  
Department of Physics, Bharathidasan University

Area of Research/Specialization:

✓ Instrumentation on high pressure low temperature physics
✓ Transport magnetic and structural properties using Diamond anvil cell
✓ Instrumentation on ac-susceptibility, thermo power and specific heat measurements
✓ Materials synthesis under high pressure and high temperature
✓ Crystal growth by floating zone method
✓ Transport and magnetic properties of strongly correlated systems under extreme conditions of high pressure (50 GPa), low temperature (100 mK) and high magnetic field (18 T)

Achievements made in Teaching/Research/Extension

- No. of Research Publications: 130
- No. of papers presented in Conferences: 53
- h-index: 18
- i-10 index: 36
- Total Citations: 1203
- Patents Granted/Filed: 2
- Products Developed: 1
- Projects Completed/Ongoing: 18/2
- Consultancies Completed/Ongoing: --

Awards and Recognitions

Awards:

- Best Poster Presentation award, Indian Academy of Science, India (2018)
- MRSI Medal Lectures Award, Materials Research Society of India, India (2018).
- Tamil Nadu Scientist Award in Physical Sciences, Tamil Nadu State Council for Science and Technology, India (2014).
- Visiting Professorship, Institute of Solid State Physics, University of Tokyo, Japan (2016).
- INSA Exchange Fellowship, DFG, Germany (2005).
- Prof. M. A. Ittyachen Award, CTMS 2001, Mahatma Gandhi University, Kottayam, India (2001).
- Young Scientist Fellowship, TSNCT, Chennai, Tamil Nadu, India (1996-1997).
- Proficiency Prize award, A.V.V.M Sri Pushpam College, Thanjavur, India (1986)
- Fellow in Academy of Sciences, Chennai
Recognitions:
- Indian Society for Technical Education (1994)
- Magnetic Society of India
- Indian Association for Physics Teachers (1995)
- Indian Ceramic Society (1994)
- Materials Research Society of India (2013)
- Indian Society for Non-Destructive Testing
- Indian Physics Association (2017)
- Physical Society of Japan (1999 - 2000)
- Materials Research Society, USA (2016-17)
- The Indian Science Congress Association (2018).

Research Group Members
- Ms. N. Subbulakshmi
- Mr. K. Manikandan
- Mr. P. Sivaprakash
- Mr. M. Kannan
- Mr. C. Saravanan
- Mr. L. Govindaraj
- Mr. M. Sathiskumar
- Ms. R. Manimegalai
- Mr. S. Muthukumaran

Past Members
1. Dr. G. Kalai Selvan
2. Dr. U. Devarajan
3. Dr. M. Kanagaraj
4. Dr. R. Thiyyagarajan
5. Dr. D. Mohan Radheep
6. Dr. S. Esakki Muthu
7. Dr. A. Murugeswari
8. Dr. K. Mydeen
9. Dr. N. Manivannan
10. Dr. T. K. Madhubala

Contact:
Dr. S. Arumugam
Professor and Coordinator
Centre for High Pressure Research
Department of Physics
Bharathidasan University
Tiruchirappalli – 620 02
Centre for Nanoscience and Nanotechnology
Department of Physics, Bharathidasan University

Area of Research/Specialization:

➢ One-dimensional self-assembled nitride semiconductor (GaN, InN, AlN and its alloys, core-shell nanowires) nanostructures for LEDs, Solar cell and water splitting applications

➢ 2D layered materials (Graphene, MoS$_2$, WS$_2$, NbS$_2$, etc) for electronic, optoelectronic and energy harvesting devices

➢ Hybrid organic and inorganic Pervoskites for next generation photovoltaic applications

➢ Single Atom Catalyst functionalized semiconductor nanowires for Photo-electrochemical assisted water splitting

➢ Drug Delivery and SERS detection of biomolecules

Achievements made in Teaching/Research/Extension

No. of Research Publications : 116
No. of papers presented in Conferences : 54
h-index : 24
i-10 index : 55
Total Citations : 2025
Projects Completed/Ongoing : Completed -7, Ongoing-3
Consultancies Completed/Ongoing : Nano User Facility (NUF)

Awards and Recognitions

• TamilNadu Scientist Award (TANSA)-2017
• Fellow, The academy of Science, Chennai (2015)
• AvH-Germany – Equipment Subsidy award - 20,000 Euro (2016)
• DST- Nanomission – Major research grant (2009-2011)
• DST- Young Scientist (DST) - 2008
• Alexander von Humboldt Fellowship (AvH), AvH Foundation, Germany (2006-2007)
• Science Technology Agency (STA) award, Govt. of Japan (2000-2002)
• Young Student Award, Abdus Salam International Center for Theoretical Physics, Trieste, Italy. (1998)
• Third world academy of Sciences, MASPEC-CNR, Parma, Italy (1998)
Research Group Members

Research Scholars:

1. Ms. R. Parameshwari
2. M. Gopalakrishnan
3. Ms.T.S. Sheena
4. Mr. S. Gopalakrishnan
5. Mr. N. Anbarasan
6. Mr. G. Paulraj
7. Mr. M. Mukilan
8. Ms. S. Abirami
9. Mr. A. Gunasekaran

Post Doc Fellows:

1. Dr. P. Manivel, UGC-Kotharai Fellow
2. Dr. S. Sadhasivam, UGC-Kothari Fellow

Past Members

1. Dr. V. Purushothaman, Scientist, KAUST, Saudi Arabia
2. Dr. P. Sundara Venkatesh, Asst. Prof. SRNM College, Sattur
3. Dr. C. Gopalakrishnan, Head, Centre for Nanotechnology, SRM University, Chennai
4. Dr. P. Justin Jesuraj, Post Doc. Fellow, Korea University,
5. Dr. V. Rajiu, Post Doc. Fellow, Zhejiang university, China
6. Dr. P. Dharmaraj, Post Doc Fellow, KAUST, Saudi Arabia

Contact:

Dr. K. Jeganathan
Professor and Coordinator
Centre for Nanoscience and Nanotechnology
Department of Physics
Bharathidasan University
Tiruchirappalli – 620 024

kjeganathan@bdu.ac.in
Faculty Members

Prof. S. Rajasekar
Co-Ordinator

A.V. Thomas
Attender/Lab.Attender
(Draughtsman)

M. Maria Siluvai Johnson
Attender/Lab.Attender
(Glass Blower)
Preface

The Central Workshop is a centralized instrumentation maintenance and fabricational laboratory which was established along with the Science Departments of the Autonomous Post – Graduate Centre of the University of Madras in 1978 under the Vth Five Year Plan. It was established with a grant from the University Grants Commission with the following three major sections:

- Machine Shop
- Glass Blowing
- Drafting and Tracing.

The Central Workshop was housed at the Department of Physics of the Post-graduate centre of the University of Madras. Consequent to the creation of the Bharathidasan University. It was moved to the Palkalaiperur Campus on 11.12.87 and housed in a separate building.

Prof. S. Rajasekar
Co-ordinator
Objectives:

- The Central Workshop will undertake designing and fabrication of equipments required for the ongoing research for the Science Departments of the University which are not otherwise available in the open market at reduced cost.
- All kinds of scientific glasswares as per the requirement can be designed and fabricated as required for teaching and research in the University.
- Training programme for M.Sc. students and Researchers to Workshop Practice, Computer aided designing and Glass blowing Practice.

Vision and Mission

- Modernized computer controlled machines.
- Conversion into a Central Instrumentation Facility to meet the needs of the University Departments.

Course Offered

Non Major Elective

a) Basic Computer aided drafting and Glass blowing practice
b) Workshop Practice

Prof. S. Rajasekar
Professor and Coordinator
Central Workshop
Bharathidasan University
Tiruchirappalli - 620 024