

ARUL ANANDAR COLLEGE (Autonomous)

(DST - FIST Awarded College)

Affiliated to Madurai Kamaraj University)

Karumathur – 625 514. Madurai – Dt. TAMILNADU



Reaccredited by NAAC
with 'A' Grade with a
CGPA of 3.66

PHYSICS NEWSLETTER

March 2021 Issue No. 1

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EDITOR'S DESK

“What we learn becomes a part of who we are. Happiness does not come from doing effortless work, but from the afterglow of satisfaction that comes after the achievement of the complicated task that demanded our best”

– Theodore Rubin

The department of Physics is delighted to deliver the foremost issue of Physics Newsletter. The contribution and dedication of faculty members, non teaching staff and students paved the way for achieving new mile stones. The Newsletter provides an ideal platform to emphasize the activities of the department. The issue is encumbered with academic activities of the department, publications, participations, research projects, honours and achievements of the students and other activities which showcase the quality and excellence. The 1st issue of the Newsletter unfolds to the readers the department activities of the academic period 2018 – 2021.

I would like to extend my sincere thanks to my editorial team *Dr. C.S.A. Raj* and *Dr. S. Sebastian* for the support and efforts towards the release of this Newsletter. The editorial board welcomes the comments and suggestions to improve the quality of the Newsletter. I would like to thank the management, teaching & non-teaching staff and students, for your kind & continued support in the progress of this department. May Almighty God shower his blessings upon all of us.

Dr. K.S. Joseph Wilson
(Editor-in-Chief)

ABOUT THE DEPARTMENT:

The Department of Physics was established in the year 1971, offering Physics as ancillary subject, for other science major students and it was upgraded as a major department in the year 1988. M.Sc programme in Physics was started in the year 2005 in the CBCS pattern. B.Sc and M.Sc degree programmes in Physics are offered under the Choice Based Credit System (CBCS) in OBE Patterns. The department was recognized as one of the research centers of Madurai Kamaraj university in the year 2013. In addition to the traditional core papers in Physics, the curriculum includes papers in the latest thrust areas like Medical Physics, Astrophysics, Information

Technology, Electric Principles and applications, Energy Physics, Space Physics, Photonics, Thin Film Science, Nano Physics, Novel Materials and Fiber Optical Communication. The staff members are specialized in various fields like Photonics, Astrophysics, Thin Film Science and Nano Materials.

The Physics lab is equipped with advanced equipments like Dip & Spin coating unit, Spray Pyrolysis, Hall Effect & Four Probe setup, SILAR coating unit, photo catalyzer setup, I-V characterization setup, Ultrasonic interferometer. Also, FTIR, UV Spectrometers, Photoluminescence setup, Probe sonicator, Tubular Furnace, Box Furnace, Hot air oven, Chiller Unit, UV-Visible Photo sensing setup, Gas Sensing setup, Double Distilled water plant, Lyophilizer and softwares like Mathematical, Lab view, IDL are available. These will be of much useful to the PG students and research scholars.

Our staff members are sanctioned with both minor and major research projects from UGC, DST, DAE and TNSCST. Our staff also guide scholars for pursuing Ph.D programmes under full /part time.

VISION:

Integrated Development of Urban and Rural Students and empowering them for Social Transformation through Physics Education.

MISSION:

To provide adequate facilities to master the theories and experiments in Physics through innovative teaching and evaluation strategies.

To enrich with scientific skills and temper to be a self-reliant and responsible Citizen of our Country.

To build AAC as a Science Policy advocacy Centre.

BEST PRACTICES:

✳ Intercollegiate Seminars and Competitions are conducted every year to enhance the knowledge of the students and to bring out the hidden skills in them.

✳ The final year students of both U.G & P.G have a chance to visit the reputed research institutes and places of scientific importance.

✳ Offering Remedial classes, Career guidance (NET/SET coaching (for PG), National Graduate Physics Exam (for UG) and Counselling.

✳ Periodic Research presentation by PG students, scholars and staff members

FACULTY MEMBERS OF THE DEPARTMENT



Dr. K.S. Joseph Wilson
Associate Professor & Head



Dr. S. Sebastian
Assistant Professor



Dr. A. Shanmugaraju
Assistant Professor



Dr. M.A. Antony
Assistant Professor



Dr. S. Valanarasu
Assistant Professor



Mrs. V. Buvaneswari
Assistant Professor



Dr. J. Sophia
Assistant Professor



Dr. R. Thomas
Assistant Professor



Dr. C.S.A.Raj
Assistant Professor



Dr. B. Prakash
Assistant Professor



Dr. I. Inigo Valan
Assistant Professor

RESEARCH AND INNOVATION

The department was recognized as one of the research centers of Madurai Kamaraj university in the year 2013. The department is well equipped with advanced instruments. Our faculty members have major and minor research projects from various funding agencies like UGC, DST, DAE, and TNSCST. The scholars are provided fellowships from these projects and also they avail research scholarship from the state and central governments.

The faculty members have published research articles in refereed International Journals with publishers like Springer, Elsevier, Taylor & Francis, World Scientific, IOP etc and also have collaborative research work with leading Research Institutes across the world.

RESOURCES AVAILABLE

The research lab is well equipped with advanced equipments such as :

- ☛ Dip & Spin coating unit
- ☛ Spray Pyrolysis
- ☛ Hall Effect & Four Probe setup
- ☛ SILAR coating unit
- ☛ Photo catalyzer setup
- ☛ I-V characterization setup
- ☛ Ultrasonic interferometer
- ☛ FTIR Spectrometer
- ☛ UV- Visible Spectrometers
- ☛ Photo luminescence setup
- ☛ Probe Sonicator
- ☛ Tubular Furnace
- ☛ Box Furnace
- ☛ Hot air oven
- ☛ Chiller Unit
- ☛ UV-Visible Photo sensing setup
- ☛ Gas Sensing setup
- ☛ Double Distilled water plant

RESEARCH SUPERVISORS

The following staff members guide scholars for pursuing Ph.D programmes under full time and part time.

- **Dr. K.S. JOSEPH WILSON**
- **Dr. A. SHANMUGARAJU**
- **Dr. S. VALANARASU**

| Year | No. of Publications In Journals |
|-----------|---------------------------------|
| 2014-2015 | 21 |
| 2015-2016 | 16 |
| 2016-2017 | 20 |
| 2017-2018 | 28 |
| 2018-2019 | 23 |
| 2019-2020 | 42 |

Ph.D. REGISTERED AND AWARDED

| Sl.No | Staff | Registered | Awarded | Submitted | Ongoing |
|--------------|------------------------------------|------------|-----------|-----------|-----------|
| 1. | Dr. I. Kulandaisamy (Retd) | 3 | 3 | - | 0 |
| 2. | Dr. M.A. Jothi Rajan (Retd) | 8 | 6 | - | 2 |
| 3. | Dr. K.S. Joseph Wilson | 14 | 7 | 2 | 5 |
| 4. | Dr. A. Shanmugaraju | 7 | 5 | - | 2 |
| 5. | Dr. S. Valanarasu | 6 | 3 | - | 3 |
| Total | | 38 | 25 | 1 | 12 |

RESEARCH PROJECTS

Our staff members are sanctioned with both minor and major research projects from UGC, DST, DAE and TNSCST as follows.

| Year | Staff | Title | Agency |
|--------------|---|--|---------|
| 2012 to 2015 | Dr. K.S. Joseph Wilson | Investigations of non-linear interactions in nanostructures | UGC |
| 2019 to 2021 | | Design and Fabrication of Microstrip Patch Antenna | TNSCST |
| 2013 to 2017 | Dr. A. Shanmugaraju | Investigation on coronal mass ejections from the sun their associated activities and geo space consequences | UGC |
| 2014 to 2017 | Dr. M. A. Jothirajan | Comparative study on antimicrobial activity of polymer assisted synthesis/ assemble of some metal oxide nano-particles | UGC-DAE |
| 2015 to 2019 | | Investigations on Maganetized Chitosan Nanofibre Composites for Hyperthermia Applications | UGC |
| 2014 to 2017 | S. Asha (Women Scientist) Under the Mentorship of Dr. M. A. Jothirajan | Investigation on biomineralization of nano hydroxyapatite intercalated biopolymeric system | DST |
| 2014 to 2018 | Dr. S. Valanarasu (Young scientist) | Fabrication and characterization of SnS/ n-type buffer layers for solar cell application | DST |

**PARTICIPATION / PAPER PRESENTATION IN CONFERENCES/
WORKSHOPS / SEMINARS :**

| NAME OF THE STAFF | NAME OF THE CONFERENCES/ WORKSHOPS/SEMINARS | NAME OF THE INSTITUTION AND PLACE | TITLE OF THE PAPER | DATE |
|------------------------------------|--|--|--|---|
| Dr. K.S. Joseph Wilson | IEEE Workshop On Advances In Photonics 2019 | Department of Physics IIT Guwahati | Nano-Photonics | 13 th - 14 th December 2019 |
| Dr.A.Shanmugaraju | International Conference on Advances in Physical Sciences | Asian Institute of Technology, Bangkok, Thailand | Major activities of the sun and their consequences | 27 th - 28 th May 2019 |
| | International workshop- IRIS workshop | Indian Institute of Astrophysics, Bangalore | - | 4 th - 8 th Nov 2019 |
| Dr. J. Sophia | National workshop on XRD and its Applications | Gandhigram rural Institute- Deemed University, Gandhigram | - | 25 th July 2019 |
| Dr. S. Sebastian | 5 th National Conference on Technically important crystalline and amorphous solids (TICAS - 2019) | Kasalingam, Academic of Research and education, Krishnankoil | Synthesis and characterization of SnS thin Films for solar cell applications | 5 th & 6 th April 2019 |
| | International conference on Advanced materials (ICAM - 2020) | Arul Anandar College, Karumathur | Synthesis and characterization of tin antimony sulphide thin Films for photovoltaic applications | 11 th & 12 th February 2020 |
| Dr. S. Santhosh Kumar Jacob | International conference on Advanced materials (ICAM - 2020) | Arul Anandar College, Karumathur | Investigation On Zn Doping Concentration On Cu ₂ O thin film By Nebulizer Spray Pyrolysis | 11 th & 12 th February 2020 |

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|----------------------------|---|---|---|---|
| Dr. R. Thomas | 4 th National conference on Recent advances in Nano technology | A. Veeriya Vandayar Memorial Sri Pushpam College, Thanjavur | Investigation on undoped and Yttrium doped FTO thin films for Opto-Electronic applications | 16 th & 17 th August 2019 |
| | International conference on Expanding Frontiers in Chemistry | Arul Anandar College, Karumathur | Investigation on Structural, optical and electrical properties of La doped FTO thin films | 13 th September 2019 |
| | National conference on Material science | Loyola College, Chennai | Investigation on Structural, optical and electrical properties of Ce doped FTO thin films | 9 th January 2020 |
| | International conference on Advanced materials | Arul Anandar College, Karumathur | Detailed investigation of Er rare earth element doped FTO thin films coated Nebulizer spray pyrolysis for Opto-electronic application | 11 th & 12 th February 2020 |
| Dr.S.Rex Rosario | International Conference on Functional Materials for Bio-Energy, Green Technology and Environmental Sustainability (FMGES-2019) | Trinity College for Women, Namakkal | Effect of Al doping on PbS thin films prepared using feasible Nebulizer spray pyrolysis for solar cell applications | 8 th August 2019 |
| Drs. V. Buvaneswari | National workshop on XRD and its Applications | Gandhigram rural Institute- Deemed University, Gandhigram | - | 25 th July 2019 |

PAPERS PUBLISHED IN JOURNALS - 2019 -20

(Journals Notified on UGC Website during the academic year 2019 - 2020)

| Sl. No | Name of the author | Title of paper | Name of journal | Year of publication |
|--------|------------------------|--|---|---------------------|
| 1 | Dr. M.A. Jothi Rajan | Investigations on Bio-mineralization of reduced graphene oxide aerogel in the presence of various polymers | Materials Today: Proceedings | 2019 |
| 2 | | Temperature assisted reorganization of silver nanoparticles in free-standing, flexible chitosan functionalized reduced graphene oxide thick films: A potential SERS probe for folic acid sensing | Materials Science and Engineering: B | 2020 |
| 3 | Dr. K.S. Joseph Wilson | Role of multilayer antireflective coating in ZnO based dye sensitized solar cell Role of Multilayer Antireflective Coating in ZnO based Dye Sensitized Solar Cell | Vacuum | 2019 |
| 4 | | Properties of ternary photonic crystal consisting of dielectric/plasma/ dielectric as a lattice period | Optik | 2019 |
| 5 | | Growth, solvent effect, optical and electrical properties of sodium 4-hydroxybenzenesulfonate dihydrate | Materials Science-Poland | 2019 |
| 6 | | Analysis of properties of metamaterial-based composite system | International Journal of Modern Physics B | 2019 |
| 7 | | Phonon Polariton Dispersion in Metal-Doped Nanocomposite Superlattice System | Journal of Optical Communications | 2019 |
| 8 | | Hydrothermal synthesis and characterization of iron/copper/nickel doped lithium niobate particles toward optoelectronic applications | AIP Conference Proceedings | 2019 |
| 9 | | Antireflection coating application of zinc sulfide thin films by nebulizer spray pyrolysis technique | AIP Conference Proceedings | 2019 |
| 10 | | Amalgamation and characterization of porous hydroxyapatite bio ceramics at two various temperatures | Materials Science in Semiconductor Processing | 2019 |
| 11 | | Phonon polariton dispersion of dielectric superlattice at various pressures in low dimensional systems | Optik - | 2019 |
| 12 | | Investigation on photonic band gap of a magneto photonic crystal | Optik | 2019 |
| 13 | | Functionalization effect of HAp with copper (Cu) having excellent dielectric applications | Surfaces and Interfaces | 2020 |

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|----|----------------------------|---|--|------|
| 14 | | Efficiency enhancement of Silicon Solar cell using Effective Interface Face Method in Antireflective Coating layers | International Journal of Modern Physics C | 2020 |
| 15 | Dr. A. Shanmugaraju | Distinction in the Interplanetary Characteristics of Accelerated and Decelerated CMEs/Shocks | Earth, Moon and Planet | 2019 |
| 16 | | Study of Interplanetary CMEs/Shocks During Solar Cycle 24 Using Drag-Based Model: The Role of Solar Wind | Solar Physics | 2019 |
| 17 | | A study on radio-loud interacting/non-interacting CMEs-associated SEPs and solar flares | Advances in Space Research | 2019 |
| 18 | | Relationships between Interplanetary Coronal Mass Ejection Characteristics and Geoeffectiveness in the Declining Phase of Solar Cycles 23 and 24 | Solar Physics | 2020 |
| 19 | | Statistical Characteristics on SEPs, Radio-Loud CMEs, Low Frequency Type II and Type III Radio Bursts Associated with Impulsive and Gradual Flares | Earth, Moon and Planet | 2020 |
| 20 | | Influence of rare earth material (Sm^{3+}) doping on the properties of electrodeposited Cu_2O films for optoelectronics | Journal of Materials Science: Materials in Electronics | 2019 |
| 21 | Dr. S. Valanarsu | Fabrication and characterization of lead sulfide (PbS) thin film based heterostructure (FTO/CdS/PbS/Ag) solar cell by nebulizer spray method | Materials Research Express | 2019 |
| 22 | | Effect of rare earth Pr doping on core characteristics of electrodeposited nanocrystalline Cu_2O films: a film for optoelectronic technology | Journal of Sol-Gel Science and Technology | 2019 |
| 23 | | In-depth study on structural, optical, photoluminescence and electrical properties of electrodeposited Cu_2O thin films for optoelectronics: An effect of solution pH | Microelectronic Engineering | 2019 |
| 24 | | Physical properties evaluation of nebulized spray pyrolysis prepared Nd doped ZnO thin films for opto-electronic applications | Journal of Materials Science: Materials in Electronics | 2019 |
| 25 | | Preparation and Characterization of Sol-Gel Dip Coated Al: ZnO (AZO) Thin Film for Opto-Electronic, Application | Semiconductors | 2019 |
| 26 | | Preparation of Eu-Doped Cu_2O Thin Films Using Different Concentrations by SILAR and Their Heterojunction Property with ZnO | Journal of Electronic Materials | 2019 |
| 27 | | Effect of carrier gas pressure on structural, optical and photovoltaic properties of tin sulphide thin films prepared by nebulizer spray pyrolysis method | Bulletin of Materials Science | 2019 |

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| 28 | Dr. S. Valanarsu | Nebulizer spray assisted chemical vapour deposited (NACVD) tin disulfide (SnS ₂) thin films for solar cell window layer applications | Materials Research Express | 2019 |
| 29 | | Correction to: Effect of Gd ³⁺ doping on key structural, morphological, optical, and electrical properties of CdO thin films fabricated by spray pyrolysis using perfume atomizer | Journal of Sol-Gel Science and Technology | 2019 |
| 30 | | Investigation on nebulizer spray coated Nd-doped SnS ₂ thin films for solar cell window layer application | Journal of Materials Science: Materials in Electronics | 2019 |
| 31 | | An effect of novel Nd ³⁺ doping on physical properties of nebulizer spray pyrolysis fabricated ZnS thin films for optoelectronic technology | Physica B: Condensed Matter | 2019 |
| | | A noticeable effect of novel Nd ³⁺ doping on physical properties of nebulizer spray deposited AZO thin films for optoelectronic technology | Optical and Quantum Electronics | 2019 |
| 32 | | An effect of Gd ³⁺ doping on core properties of ZnS thin films prepared by nebulizer spray pyrolysis (NSP) method | Physica B: Condensed Matter | 2019 |
| 33 | | Analysis of Pr co-doped Al:ZnO thin films using feasible nebulizer spray technique for optoelectronic technology | Applied Physics A | 2019 |
| 34 | | Investigation on nebulizer spray deposited Gd-doped PbS thin films for photo sensing applications | Journal of Materials Science: Materials in Electronics | 2019 |
| 35 | | "Response to "Comment on An effect of novel Nd ³⁺ doping on physical properties of nebulizer spray pyrolysis fabricated ZnS thin films for optoelectronic technology | Physica B: Condensed Matter | 2019 |
| 36 | | Effect of Er doping on the ammonia sensing properties of ZnO thin films prepared by a nebulizer spray technique | Journal of Physics and Chemistry of Solids | 2020 |
| 37 | | Unraveling the enhanced photocatalytic decomposition efficacy of the Al-doped ZnO nanoparticles @ graphene sheets | Journal of Physics D Applied Physics | 2020 |
| 38 | | Enhancement of photo-sensing properties of CdS thin films by changing spray solution volume | Sensors and Actuators A Physical | 2020 |
| 39 | | Enhancement of optoelectronic parameters of Nd-doped ZnO nanowires for photodetector applications | Optical Materials | 2020 |

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| 40 | Dr. C.S.A. Raj | Optimizing the annealing temperature of pure ZnTe for solar cell applications | International Journal for research and analytical reviews | 2019 |
| 41 | Dr. S. Sebastian | Investigations on Fe doped SnS thin films by nebulizer spray pyrolysis technique for solar cell applications | Journal of Materials Science: Materials in Electronics | 2019 |
| 42 | | Influence of Al doping concentration on the opto-electronic chattels of SnS thin films readied by NSP | Optical and Quantum Electronics | 2019 |
| 43 | | Enhancement in photovoltaic properties of Nd:SnS films prepared by low-cost NSP method | Rare Metals | 2019 |
| 44 | | Microstructural and electrical properties evaluation of lead doped tin sulfide thin films | Journal of Sol-Gel Science and Technology | 2019 |
| 45 | | Quantitative analysis of Ag-doped SnS thin films for solar cell applications | surface Engineering | 2020 |
| 46 | | Physical and electrical properties' evaluation of SnS:Cu thin films | Surface Engineering | 2020 |
| 47 | | Dr. S. Santhosh Kumar Jacob | Enhanced optoelectronic properties of Mg doped Cu ₂ O thin films prepared by nebulizer pyrolysis technique | Journal of Materials Science: Materials in Electronics |
| 48 | Sn Doping Effect on the Structural, Optical and Electrical Properties of Cu ₂ O Thin Film Prepared by Nebulizer Spray Technique | | International Journal of Scientific Research and Reviews | 2019 |
| 49 | Investigation on structural, optical and photovoltaic properties of Barium doped cuprous oxide thin films by nebulizer spray technique | | Materials Research Express | 2019 |
| 50 | Improving carrier transport in strontium-doped cuprous oxide thin films prepared by Nebulizer spray pyrolysis for solar cell applications | | Indian Journal of Physics | 2019 |
| 51 | Dr. S. Rex Rosario | Deposition of p-type Al doped PbS thin films for heterostructure solar cell device using feasible nebulizer spray pyrolysis technique | Physica B: Condensed Matter | 2019 |
| 52 | | Ag-doped PbS thin films by nebulizer spray pyrolysis for solar cells | International Journal of Energy Research, Wiley | 2020 |

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| 53 | | Fabrication of heterostructure solar cell using the optimized Sn incorporated PbS films via atomized nebulizer spray pyrolysis | Materials Science in Semiconductor Processing | 2020 |
| 54 | Dr. R. Thomas | Tailoring the properties of nebulizer spray pyrolysis coated FTO thin films through rare earth element terbium for optoelectronic applications | Physica B: Condensed Matter | 2020 |
| 55 | | An effect of lanthanum doping on physical characteristics of FTO thin films coated by nebulizer spray pyrolysis technique | Optical Materials | 2020 |
| 56 | | Investigation of erbium co-doping on fluorine doped tin oxide via nebulizer spray pyrolysis for optoelectronic applications | Optical and Quantum Electronics | 2020 |
| 57 | | Opto-electronic properties of cerium-doped FTO thin films prepared using Nebulizer spray technique for TCO application | Optik | 2020 |
| 58 | | Influence of yttrium doping on microstructural and optical properties of FTO thin films prepared by nebulizer spray technique | Materials Today Communications | 2020 |

FACULTY AS RESOURCE PERSON IN OTHER INSTITUTES

Our faculty Members are invited as resource persons / invited speakers in seminars / conferences conducted by various educational institutes at the members national and International level.

Dr. K.S. Joseph Wilson, Associate Professor and Head,

- ✦ Invited lecture on ADVANCES IN PHOTONICS at IIT Guwahati in December 2019.
- ✦ Organizing Secretary & editor of 23rd FAI International Conference on “ Emerging Trends & Adaptation of Spiritually in Managment, Artificial Intelligence, Education Health, Tourism, Science & Technology” held from 19th - 21th Feb. 2021.
- ✦ Invited talk in a National level webinar on “Emerging Materials for solar Energy Conveson” on 12.01.2021 Organized by th Dept. of Physics, SETHU INSTITUTE OF TECHNOLOGY
- ✦ Invited talk on Nano Photonics in a National Webinar on 21.07.2020 Organized by the Dept. of Physics Lekshimipuram College of Arts & Science College, Neyyoor, Kanyakumar Dt.



Dr. A. Shanmugaraju, Assistant Professor,

- ✦ Invited lecture on “CME’S Flares, radio bursts and their association” during an International Workshop at Kodaikannal Solar Observatory in January 2020.
- ✦ Invited talk on “Astro Physics -Introduction and Opportunities” in V.V.V. College for Women, Virudhunagar, January 2020.

ACADEMIC ACTIVITIES

The department organizes National/ International conferences/ workshops on emerging fields in Physics. PG students and Research scholars are encouraged to give research seminars in their field of research.

TWO-DAY STATE LEVEL SEMINAR ON “RECENT TRENDS IN PHYSICS”

The Department of Physics organized a two day state level seminar on “Recent Trends in Physics” on 5th & 6th February 2019 at Arul Anandar College, Karumathur. The programme started with an inaugural function in Mother Teresa Hall. Dr. K.S. Joseph Wilson, Associate Professor & Head, Department of Physics, welcomed the gathering. Rev.Fr.Dr. Basil Xavier, S.J, Principal presided over the function and delivered the presidential address and Dr. M. Sathish, Scientist, Central Electro-Chemical Research Institute (CECRI), Karaikudi gave the keynote address. In his address, he cited the Recent Trends in the modern scientific field. He insisted that the science students should update themselves with the latest technology. He motivated the students and the staff members to do the research. Dr. J. Sophia, Assistant Professor proposed vote of thanks to all the participants and the organizers.



The function continued with technical session by Dr. M. Sathish, wherein he spoke on “Energy Storage and its Applications”. Dr. N. Prithivikumaran, Asso. Professor & Head, Dept of Physics, VHNSN College, Virudhunagar, delivered a special lecture on “Nano Electronics. Dr. A. Chandra Bose, Professor, Dept of Physics, National Institute of Technology (NIT), Trichy, enlightened the young minds on the topic “ Nano Technology and its applications”. It was followed by paper presentation by Scholars and staff members from various Colleges in Tamil Nadu. These lectures were very interactive and fruitful to the participants.

On 6th February, the second day the guest speaker for the technical session-1 was Dr. V. Vasu, Asso. Professor & Head, School of Physics, Madurai Kamaraj University, where he highlighted the recent trends in physics that are useful for the society. The second session was handled by Dr. Ancemma Joseph, Asst. Professor, Dept. of Physics, Fathima College, Madurai. She discussed the recent trends in Medical Physics.



Students along with their staff incharge from nearby Colleges participated in the programme. Different competitions in physics were conducted. The students actively participated in the events. During the valedictory function, Dr. S. Michael John Peter, Deputy Principal, Arul Anandar College, Karumathur gave the valedictory address and distributed the certificates.

TWO-DAY INTERNATIONAL CONFERENCE ON “ADVANCED MATERIALS”

The Department of Physics organized a two day International Conference on “Advanced Materials” on 11th & 12th February 2020 at Arul Anandar College, Karumathur. The inaugural function of this conference was conducted in Mother Teresa Hall with the welcome address by Dr. K.S. Joseph Wilson, Associate Professor & Head, Department of Physics. Rev. Dr. Basil Xavier, SJ, Principal presided over the function and delivered the presidential address. Rev. Dr. John Pragasam, SJ, Rector gave the inaugural address. Dr. Eswaran Murugasen, Marie Curie Researcher from Paris, France, gave the keynote address. In his address, he cited the recent advances in scientific knowledge and the need for the science students to equip themselves with the latest technology that are available to us. He motivated the students and the staff members to do the research. Dr. C.S.A. Raj, Assistant Professor proposed vote of thanks to all the resource persons and participants.

The function continued with technical session by Dr. Eswaran Murugasen, wherein he spoke on “Elaboration of functional materials” which was well received by the audience with spell bound attention.



Dr.B.M. Nagabushana, Asso.Professor & Head, Dept of Chemistry, Ramiah Institute of Technology, Bangalore, delivered a special lecture on “Nano materials and their applications”. Dr. S. Jerome Das, Associate Professor & Head, Dept.of Physics, Loyola College, Chennai, enlightened the young minds on the topic “Characterization of Materials”. It was followed by paper/poster presentation by the participants.

The second day programme started with the welcome address by Dr.A.Shanmugaraju, Asst. Prof. of Physics. In the technical session, Visiting professor of Boston College, USA and Rector of LoyolaCollege, Chennai, Rev. Dr. Francis P. Xavier S.J, highlighted the nano science research that are useful for the society. The next session was handled by Dr. S. John Mary, Asst. Professor, Dept of Chemistry, Loyola College, Chennai. She discussed the Corrosion Inhibition by green materials. Mr. M. Kasinathan, Scientific officer, IGCAR, Kalpakkam gave an invited talk on materials for Fiber optic sensors. The last session was handled by Dr. M. Mahendran, Professor, Thiagarajar College of Engineering, Madurai, discussed the smart materials followed by paper/poster presentations. 85 Papers were presented through poster and oral presentations. Around 200 research scholars and PG students participated from all over the country.

ASSOCIATION ACTIVITIES / STUDENTS ORIENTATION

The department organizes Orientation programme every year for the first year UG and PG students to make the students aware of the various dimensions of the UG, PG and Research programme as well as the department activities. The Department also Conducts the national level test NGPE/IAPT for UG students every year. Separate NET/SET coaching is given to PG students and Reasearch Scholars

INTERCOLLEGIATE COMPETITIONS

The association organized PHYSAAC in the academic year 2019 - 2020. It is an intercollegiate meet organised by the department every year to bring out the talents/ skills in Physics by the way of conducting various competitions such as Quiz, Paper presentation, Dumb- charade, Act as a scientist, AD-act, and Model Display etc Eight colleges in and around Madurai participated. Kalasalingam Arts and Science College won the overall shield. Dr. S. Valanarasu, Vice President of Physics Association organized these events. Rev. Dr. Paul Prakash, Vice Principal distributed the prizes and certificates.



SEMINAR / GUEST LECTURE / AWARENESS PROGRAMME

The association also organizes Intradepartmental competitions to impart wide knowledge of basic and applied Physics concepts and to enhance leadership quality of the students. Exposures in the form of various competitions are given to enrich their knowledge and skill.



Dr.T.Rajeshkumar, Assistant Prof., G.T.N.College, Dindigul gave an invited lecture on “Nanotechnology for Energy and Environmental Applications” in October 2019.

Mr.S.Sivaramakrishnan, Assistant Prof., Madura College, Madurai, was invited to deliver a Guest Lecture on “Recent Trends in Physics” in September 2019.



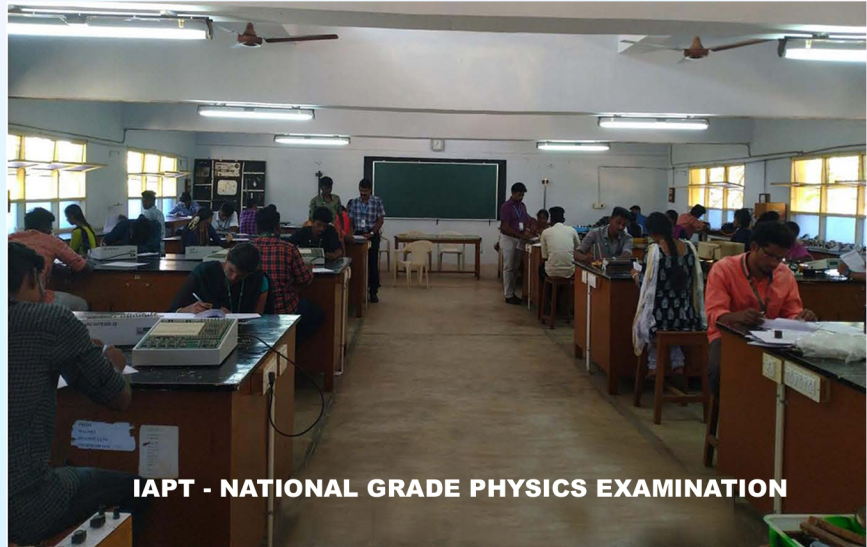
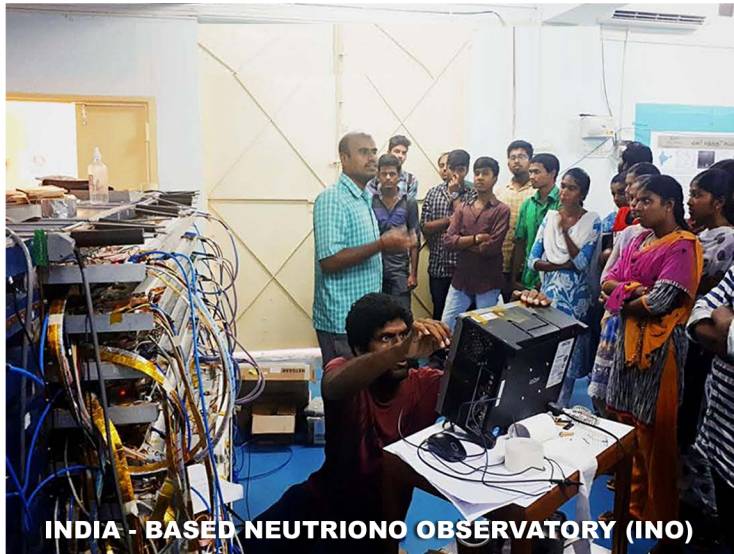
In order to create an awareness on neutrino, the association arranged a “NEUTRINO AWARENESS PROGRAMME” to all the final year UG and PG students in Mother Teresa hall. **Prof. Gobinda Majumder**, INO - Project Director, Mumbai was invited as the chief guest for the programme.

In December 2019, a “Solar Eclipse Awareness Camp” was organized by the Physics association to all the students of AAC in the open air, near the Principal’s office.



FIELD EXPOSURE/ INDUSTRIAL VISIT

The association organizes Field trips/ educational tours to scientifically important places such as INO, Vadapazhanji Madurai, solar energy park- MKU, Kodaikanal Observatory, Nuclear power plant, Kudankulam, ISRO Trivandrum, Visvesvaraya Science Museum, Bangalore.



STAFF ACHIEVEMENTS / HONOURS RECEIVED

| NAME OF THE STAFF | TITLE OF THE HONOURS CONFERRED | NAME OF THE UNIVERSITY/ORGANISATION | DATE |
|----------------------------|---|---|---------------------------|
| Mr.S.Sebastian | Best paper award | Periyar University, Salem | 23 rd Aug 2018 |
| Dr.A. Shanmuga raju | Best Scientist Award | International Multidisciplinary Research Foundation (IMRF), Thailand. | 27 May 2019 |
| Dr. C.S.A Raj | International Distinguished Researcher in Thin Film Physics | International Journal for Research Under Literal Access(RULA) | 15 th Aug 2019 |
| Dr.S. Valanarasu | Award for publication | Arul Anandar College, Karumathur | March 2020 |



HIGHER EDUCATIONAL QUALIFICATIONS ACQUIRED

| NAME OF THE STAFF | NET/SET | NAME OF THE UNIVERSITY | YEAR |
|----------------------|--|--------------------------|------|
| Dr. J. Sophia | Qualified in the Tamil Nadu State Eligibility Test (TNSET) | Mother Teresa University | 2018 |

NAME OF THE FACULTIES COMPLETED Ph.D. IN 2020

| S. No. | Name | Title | University | Month & Year | Name of the Guide |
|--------|--------------------------------|---|----------------------------|------------------|---|
| 1. | S. Sebastian | Synthesis and characterization of SnS thin film for solar cell applications | Madurai Kamaraj University | January & 2020 | Dr. I. Kulandaisamy Arul Anandar Collage |
| 2. | S. Santhosh Kumar Jacob | Synthesis and characterization of Cu ₂ O based solar cell using spray pyrolysis method | Madurai Kamaraj University | August & 2020 | Dr. I. Kulandaisamy Arul Anandar Collage |
| 3. | S. Rex Rosario | Deposition and characterization of semi conducting thin films for photo-voltaic applications | Madurai Kamaraj University | August & 2020 | Dr. I. Kulandaisamy Arul Anandar Collage |
| 4. | R. Thomas | Investigation on rare Earth Metal ion doped FTO thin films for Optoelectronic applications | Madurai Kamaraj University | September & 2020 | Dr.T. Madhavan SVN Collage Dr.M.A Jothi Rajan Arul Anandar Collage |

PROFESSIONAL ENRICHMENT

| NAME OF THE STAFF | ORIENTATION PROGRAMME/REFRESHER COURSE/SHORT TERM COURSES / REVIEWER | NAME OF THE UNIVERSITY/INSTITUTION / PUBLISHER | DATE |
|------------------------------|--|--|--|
| Dr.K.S. Joseph Wilson | Reviewer of 1. Journal of Physics and Chemistry of Solids, 2. Journal of Optik Optics, 3. Journal of Sensors & Actuators: A. Physical, 4. Participated in the Refresher course in Physics 5. Editor of : Emerging trends & Adaption of Spirituality in Management, Artificial Intelligence, Education, Health, tourism, Science & Technology | Elsevier Madurai Kamaraj University, Madurai 23rd FAI - ICS 2021 | February 2019 16.11.2018 to 06.12.2018 19 .02.2021 to 21.02.2021 |
| | Dr. S. Valanarasu | Reviewer of 1. Ceramics International. 2. Materials Research Express 3. Journal of Materials Science Materials in Electronics | Elsevier 25.09.2018 |
| Dr. A. Shanmuga raju | Visited the Udaipur Solar Observatory for research | Physical Research Laboratory, Udaipur | 13.11.2018 to 18.11.2018 |
| | Reviewer of Advances in Space | Elsevier | 11.11.2020 |

NAME OF THE SCHOLARS COMPLETED Ph.D. IN 2020

| S. No. | Name | University | Month & Year | Name of the Guide |
|--------|--------------------|----------------------------|----------------|---|
| 1. | N.Abirami | Madurai Kamaraj University | December& 2020 | Dr.K.S.Joseph Wilson Arul Anandar Collage |
| 2. | V. Doni Pon | Madurai Kamaraj University | December& 2020 | Dr.K.S.Joseph Wilson Arul Anandar Collage |
| 3. | G.Selvarani | Madurai Kamaraj University | October& 2020 | Dr.A. Shanmugaraju Arul Anandar Collage |

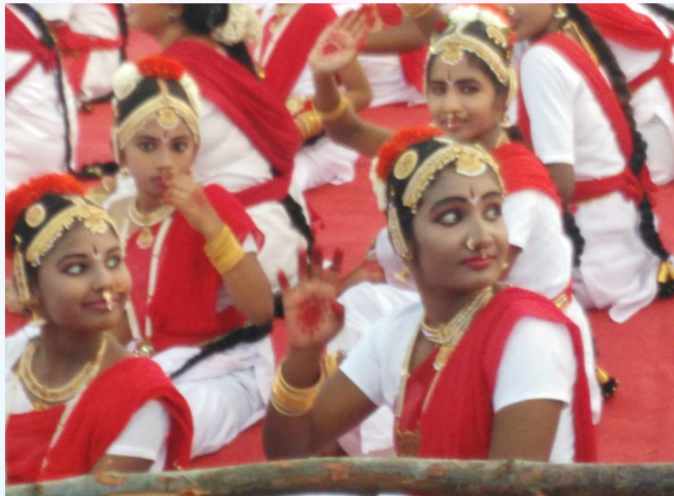
STUDENTS ACHIEVEMENTS

| NAME OF THE STUDENT | NAME OF THE ACTIVITY | YEAR |
|---|---|----------------------------|
| UG Students | Overall shield at Intercollegiate competition at Fatima College, Madurai | 20 th Feb 2017 |
| A. Sahaya Jasmine (II M.Sc.,) P. Hemalatha (II M.Sc.,) A. Anbarasan (II M.Sc.,) M. Albert Jerry (II M.Sc.,) C.K Balaji (II M.Sc.,) T. Subash (II M.Sc.,) | Participated in a National workshop on XRD and its Applications held at Gandhigram Rural Institute-Deemed University, Gandhigram. | 25 th July 2019 |
| III B.Sc. Physics | Participated in INDIAN ASSOCIATION OF PHYSICS TEACHERS-National Graduate Physics Examination | 19 th Jan 2020 |
| G. Amal Sundar (I M.Sc.,) R. Joseph Amlanathan (I M.Sc.,) | Second Prize in Poster Presentation in One day state level seminar on Astrophysics, Vivekananda College | 28 th Jan 2020 |
| R. Vasanth (III B.Sc.,) | Participated in paper presentation in One day state level seminar on Astrophysics, Vivekananda College | 28 th Jan 2020 |

| | | |
|---|---|---|
| G. Nirexia Shree III B.Sc., | I & II Prizes (integration Skill, Group dance)– National integration Camp-2020, Bangalore University,Bengaluru | 24 th to 30 th Jan 2020 |
| M. Akash } III B.Sc., B. Akashvarman } P.Hemalatha } C.K. Balaji } II M.Sc., M.Albert Jerry } | Participated in one day workshop in India Based Neutrino Observatory (Tata Institute of Fundamental Research) | 28 th Jan 2020 |



• **J.RUFINA BRISKILLA** (III B.Sc Physics) made the official Guinness World Record Attempt 'Largest Bharathanatiyam dance' at S.I.V.E.T college, Gowriwakkam, Chennai, Tamilnadu, India on 8th February 2020.



The nature of Tamil culture, literature, folklore, and cultural fests are celebrated all over the world. An unbelievable event 'SATHIR 10000' organized by the Tamilnadu government where more than 10,000 Bharatanatyam dancers performed "Bharatanatyam" on a single stage. This impressive feat of showing dance performance on that stage is a great and remarkable achievement.

• **J.RUFINA BRISKILLA** created a new world Record in Tamil Traditional Arts (Bharathanatiyam). This *event* was successfully completed with 600 & above participants with different styles of dances for the music of Parai. She performed Bharathanatiyam for the same music in the world record attempt in SAJAR TRUST (Life science Academy) which is Organized by South Indian Silambam Academy Madurai, Tamilnadu. This achievement was Registered on 6th December 2020 in Jetlee Book of records...



AWARDS RECEIVED BY OUR RESEARCH SCHOLARS

| | | | |
|--------------------------|--|---|--------------------------|
| M. Ismail Fathima | Best Paper award | 2 nd International Conference on Recent Trends in Applied Science and Technology (ICRTAST-2018) at Periyar University, Salem, 2018 | 23.08.2018 to 25.08.2018 |
| | Best Paper award | Intercollegiate Research Fest EXPLORIA -19 , Fathima College, Madurai 2019 | 20.02.2019 |
| N. Abirami | Poster Presentation Best Paper Poster Award | International Conference on "Expanding Frontiers in Chemistry (EFC-19)" | 13.09.2019 |

CONTRIBUTIONS / ENDEAVOURS OF RESEARCH SCHOLARS

| | | | |
|--------------------------|--------------------|--|--------------------------|
| M. Ismail Fathima | Paper Presentation | IEEE Workshop on recent Advances in photonics held at IIT Gawgathi, Assam | 13.12.2019 to 14.12.2019 |
| | Participation | National workshop on XRD and its Applications held on Gandhigram at rural university | 2019 |
| | Participation | Advances in optics and Photonics held at UGC-NRC , University of Hyderabad | 2019 |
| | Presentation | 64th DAE SSPS on Cobalt doped ZnO films as antireflection coating application for solar cell 2019 | 18.12.2019 to 22.12.2019 |
| | Presentation | 3 rd International Conference on Recent Trends in applied Science and Technology, SSN Institution | 2019 |
| N. Abirami | Participation | National workshop on XRD and its Applications held on Gandhigram rural University | 2019 |

| | | | |
|------------------------|--------------------|---|--------------------------------|
| G.Selvarani | Participation | COSPAR 2020 International workshop on Coronal and Interplanetary shocks, IIA, Kodaikanal Solar Observatory | 06.01.2020 to 17.01.2020 |
| P.Vijayalakshmi | Paper presentation | IRIS international workshop, IIA, Bangalore | 04.11.2019 to 08.11.2019 |
| | Participation | COSPAR 2020 International workshop on Coronal and Interplanetary shocks, IIA, Kodaikanal Solar Observatory | 06.01.2020 to 17.01.2020 |
| | Paper Presentation | Astronomical Society of India (ASI) Meeting 2020, IISER, Tirupathi | 13.02.2020 to 17.02.2020 |
| Mr.K. Suresh | Visit Abroad | Selected as SCOSTEP Visiting Scholar to NASA, USA | 01.07.2018 to 28.02.2019 |



CELEBRATIONS

The college management encourages the departments every year to celebrate pongal festival. Last academic year, we celebrated the festival in front of Arupae Illam. Various competitions related to the festival were organized and prizes were distributed to the winners

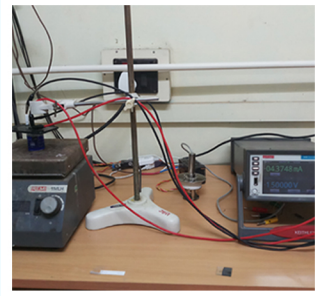
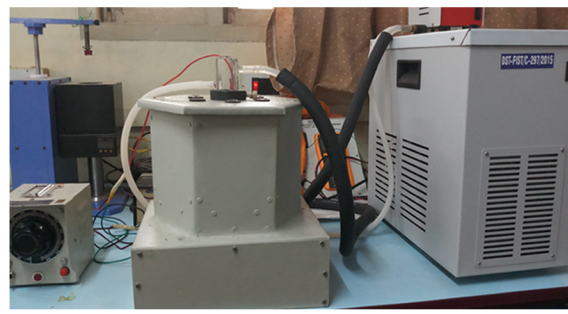
ALUMINI ASSOCIATION

Physics Alumni is effectively functioning for the benefit of the budding physicists and Alumni Scholarships are available for the poor and meritorious students. The Golden Jubilee Alumni meeting was organized on 7th march 2020.



PG & RESEARCH DEPARTMENT OF PHYSICS

RESEARCH FACILITIES



ARUL ANANDAR COLLEGE (Autonomous)

(DST - FIST Awarded College)

Affiliated to Madurai Kamaraj University)

Karumathur – 625 514. Madurai – Dt. TAMILNADU

Ph: 04549 - 287221



Reaccredited by NAAC
with 'A' Grade with a
CGPA of 3.66