

## Dr. G. Phaneendra Reddy

Asst. Professor in Physics (C),  
(Academic Consultant)  
Dr. YSR Architecture and Fine Arts University,  
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Research gate id: <https://www.researchgate.net/profile/Phaneendra-Reddy>

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## Academic Credentials

**Ph.D.:** Physics (Full-time) (2014 - 2019) Sri Venkateswara University, Tirupati, A.P., INDIA.

*\*Thesis Title: “Preparation of Cu-Sn-S films by sulfurization of sputtered metallic precursors for solar cell application”  
(Research Supervisor: Prof. K.T. Ramakrishna Reddy).*

**M.Sc.:** Physics, with Vacuum and Thin film Technology as special subjects (77.40%)  
(2010 - 2012), Sri Venkateswara University, Tirupati, Andhra Pradesh, INDIA.

**B.Sc.:** Physics, Mathematics, and Computer Science as optional subjects (70.77%) (2007-2010),  
Sri Venkateswara University, Tirupati, Andhra Pradesh, INDIA.

## Academic Honors, Awards:

- Received **A.P. Young Scientist Award-2020** by AP Academy of Sciences, Govt. of AP, India.
- Nominated as **A.P. Associate fellow-2020** by AP Academy of Sciences, Govt. of AP, India.
- Received **Best Poster presentation award** in “National Conference on Novel Materials for Device Application, NCNMDA-2018, November 04-05, 2018, S.V. University, Tirupati, India.
- Received Basic Scientist Research Fellowship for Meritorious Students, UGC-BSR Fellowship in 2015
- Qualified in National Eligibility Test, **NET (LS)** with **88<sup>th</sup>** Rank in Dec-2012 (Conducted by Council of Scientific Industrial and Research, **CSIR**, India).

## Projects involved

Associated as a visiting student (**Northumbria University**, Newcastle, upon Tyne, UK) in Major Research project sanctioned by **UK (British Council)-India (DST) Education & Research Initiative (UKIERI)** programme, entitled “**Development of Efficient low Cost Photovoltaic Solar Cells Based on the use of Tin Sulphide Absorber Layers**” from May 2014 to September 2016.

## Teaching Experience:

- Worked as a **Guest faculty** in the Department of Physics, Sri Venkateswara Vedic University, Tirupati, Andhra Pradesh, India from **August 2019 to May 2022**.  
**Graduate level courses:** Mechanics, Solid State Physics, Astrophysics, Electronics & Electromagnetic Theory
- Taught Physics to Engineering undergraduates as a **Guest lecturer** at S.V.U. college of Engineering, Sri Venkateswara University, Tirupati, Andhra Pradesh, India from **March 2016 to March 2019**
- Handled Theory and practical classes for **M.Sc. Physics** in the Department of Physics, SVU College of Sciences, Sri Venkateswara University, Tirupati (**During 2016-2019**).
- Handled theory classes for **DDE M.Sc. Physics** in the Department of Physics, Sri Venkateswara University, Tirupati (**During 2016-2019**).
- Working as an Academic Consultant in Dr. YSR Architecture and Fine Arts University from 21-07-2022 to Till date.

## Research Experience:

- ❖ **Senior Research Fellow (UGC-BSR)** **(Dec 2017 – August 2019)**  
(Dept. of Physics, Sri Venkateswara University, India)

Development and optimization of various wide band gap materials and metallic thin films for optical coatings, and solar cell application.

### Tasks handled:

- Optimization of  $\text{Cu}_2\text{SnS}_3$  (CTS) films by two stage process (Sputtering + Sulfurization).
- Successfully prepared the CTS hetero-junction solar cell.
- Device study:  $V_{oc}$ ,  $I_{sc}$ , FF and Efficiency studies.
- **Characterizations:** XRD, SEM, AFM, UV-Vis-NIR Spectrophotometer, Sun simulator, Two probe and Hall effect measurements.

- ❖ **Junior Research Fellow(UGC-BSR)** **(Dec 2015 – Dec 2017)**  
(Dept. of Physics, Sri Venkateswara University, India)

Development and optimization of various wide band gap materials and metallic thin films for optical coatings, and solar cell application

### Tasks handled:

- Optimization of functional chalcogenide and oxide thin films ( $\text{In}_2\text{S}_3$ , Mo:ZnO, ..) for Window layer and antireflection coating application in solar cells.
- **Characterizations:** XRD, SEM, UV-Vis-NIR Spectrophotometer.

## List of Research Publications (SCI & Scopus Indexed Publications)

1. **G. Phaneendra Reddy**, Sivajee Ganesh Kapu, , Sangaraju Sambasivam, Subba Rao Yakkate, Mohan Reddy Pallavolu, “Facile fabrication of hexagonal Ni(OH)<sub>2</sub> nanoparticles anchored g-C<sub>3</sub>N<sub>4</sub> layered nanocomposite electrode material for energy storage applications”, **Diamond and related materials**, 129 (2022) 109376 (IF = 3.806).
2. **G. Phaneendra Reddy**, T. Sreenivasulu Reddy, Sumalatha Chevva, K.T.R. Reddy\*, **Precursor Molarity Influence on Sprayed Mo- doped ZnO Films for photovoltaics**, **Indian Journal of Science and Technology**, 15(36) (2022) 1800-1807. <https://doi.org/10.17485/IJST/v15i36.842>
3. Yedluri Anil Kumara, Himadri Tanaya Das, **G. Phaneendra Reddy**, Ramesh Reddy Nallapureddy, Mohan Reddy Pallavolu, Salem Al Zahmi, Ihab M.Obaidat, “Self-supported Co<sub>3</sub>O<sub>4</sub>@Mo-Co<sub>3</sub>O<sub>4</sub> needle-like@nanosheets heterostructured architectures of battery-type electrodes for high- performance asymmetric supercapacitors”, **Nanomaterials**, 12 (2022) 2330 (1-14). (IF = 5.719) <https://doi.org/10.3390/nano12142330>
4. K. Poshan Kumar Reddy, K. M. M. D. K. Kimbulapitiya, Srikanth Vuppala, Kuangye Wang, **G. Phaneendra Reddy**, Krishna P Pande, Po-Tsung Lee, Yun-LunChueh, “A nickel coated copper substrate as a hydrogen evolution catalyst”, **Catalysts**, 12, 58 (2022) 01-10. (IF = 4.501) [doi: 10.3390/catal12010058](https://doi.org/10.3390/catal12010058).
5. **G. Phaneendra Reddy**, P. Mallika Bramaramba Devi, K.T. Ramakrishna Reddy\*, **Optical and electrical investigations on Cu<sub>2</sub>SnS<sub>3</sub> layers prepared by two-stage process**, **Chinese Journal of Physics**, 67 (2020) 458-472. (IF = 3.957). <https://doi.org/10.1016/j.cjph.2020.08.003>
6. **G. Phaneendra Reddy**, G. Sreedevi, K.T. Ramakrishna Reddy\*, **Sulfurization temperature dependent physical properties of Cu<sub>2</sub>SnS<sub>3</sub> films grown by a two-stage process**, **Materials Science in Semiconductor Processing**, 86 (2018) 164–172, (IF = 4.644). <https://doi.org/10.1016/j.mssp.2018.06.021>
7. **G. Phaneendra Reddy**, T. Sreenivasulu Reddy, K.T. Ramakrishna Reddy\*, **A critical study of the optical and electrical properties of transparent and conductive Mo-doped ZnO films by adjustment of Mo concentration**, **Applied Surface Science**, 458 (2018) 333–343, (IF = 7.392). <https://doi.org/10.1016/j.apsusc.2018.07.093>
8. G. Sreedevi, M. Vasudeva Reddy, A. Salh, **G. Phaneendra Reddy**, K.T. Ramakrishna Reddy\*, Chinho Park\*, Woo Kyoung Kim, **Influence of deposition temperature on the efficiency of SnS solar cells**, **Solar Energy**, 184 (2019) 305-314, (IF = 7.188) <https://doi.org/10.1016/j.solener.2019.04.010>
9. M. Vasudeva Reddy, P. Mohan Reddy, **G. Phaneendra Reddy**, G. Sreedevi, Y.B.K.K. Reddy, P. Babu, Woo Kyoung Kim, K. T. Ramakrishna Reddy\*, and Chinho Park\*, **Review on Cu<sub>2</sub>SnS<sub>3</sub>, Cu<sub>3</sub>SnS<sub>4</sub>, and Cu<sub>4</sub>SnS<sub>4</sub> thin films and their photovoltaic performance**, **Journal of Industrial and Engineering Chemistry**, 76 (2019) 39-74, (IF = 6.76). <https://doi.org/10.1016/j.jiec.2019.03.035>
10. P. Mohan Reddy, M. Vasudeva Reddy, **G. Phaneendra Reddy**, and Chinho Park\*, **Development of SnSe thin films through selenization of sputtered Sn-metal films**, **J. of Materials Science: Materials in Electronics**, 30 (2019) 15980-88, (IF = 2.779). <https://doi.org/10.1007/s10854-019-01968-9>

11. P. Mallika Bramaramba Devi, **G. Phaneendra Reddy**, and K.T. Ramakrishna Reddy\* **Effect of deposition time on structural, morphological and optical properties of PVA capped SnS films grown by CBD process**, *Semiconductors*, 53 (2019) 15-20, (IF = 0.660). <https://doi.org/10.1134/S1063782619130062>
12. P. Mallika Bramaramba Devi, **G. Phaneendra Reddy**, K.T. Ramakrishna Reddy\*, **Structural and optical studies on PVA capped SnS films grown by chemical bath deposition for solar cell application**, *Journal of Semiconductors*, 40 (2019). <https://doi.org/10.1088/1674-4926/40/5/000000>
13. P. Mallika Bramaramba Devi, **G. Phaneendra Reddy**, K.T. Ramakrishna Reddy\*, **Optical investigations on PVA capped SnS nanocrystalline films deposited by CBD process**, *Materials Research Express*, 6 (2019). (IF = 2.025). <https://doi.org/10.1088/2053-1591/ab4a52>

### **Conference Proceeding Papers**

1. **G. Phaneendra Reddy**, K.T. Ramakrishna Reddy \*, E.E. Venhlinkaya, and M.S. Tivanov, V.F. Gremenok, **Effect of sulfurization time on the structural properties of Cu<sub>2</sub>SnS<sub>3</sub> films deposited by two-stage process**, *Actual Problems of Solid State Physics Proceedings of the VIII International Scientific Conference 24 – 28 September 2018, Minsk, Belarus*. <http://elib.bsu.by/bitstream/123456789/206489/1/%D0%A4%D0%A2%D0%A2-Reddy-%D0%BC%D0%B0%D1%82%D0%B5%D1%80%D0%B8%D0%B0%D0%BB%D1%8B.pdf>
2. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, **Preparation and characterization of Cu<sub>2</sub>SnS<sub>3</sub> thin films by two stage process for solar cell application**, *Materials today: proceedings*, 7 (2017) 2401-12406. <https://doi.org/10.1016/j.matpr.2017.10.010>
3. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, **Sulfurization effect on optical properties of Cu<sub>2</sub>SnS<sub>3</sub> thin films grown by two stage process**, *AIP Conference Proceedings*, 1832, 120032 (2017). doi: 10.1063/1.4980717
4. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, **Physical properties of Cu<sub>2</sub>SnS<sub>3</sub> thin films prepared by sulfurization of co-sputtered Cu-Sn metallic precursors**, *Materials today: proceedings*, 4 (2017) 12518-12524. <https://doi.org/10.1016/j.matpr.2017.10.054>
5. S. Rasool, **G. Phaneendra Reddy**, K.T. Ramakrishna Reddy\*, M. Tivanov, and V.F. Gremenok **Effect of Substrate temperature on structural and optical properties of In<sub>2</sub>S<sub>3</sub> thin films grown by thermal evaporation**, *Materials Today: Proceedings*, 4 (2017) 12491–12495. <https://doi.org/10.1016/j.matpr.2017.10.049>
6. S.N. Nwankwo, **G. P. Reddy**, K.T.R. Reddy, N.S. Beattie, V. Barrioz, R.W. Miles, and G. Zoppi\*, **Optimized growth of thermally evaporated tin sulphide (SnS) thin films**, *12<sup>th</sup> Photovoltaic Science, Applications and Technology Conference PVSAT-12, CONFERENCE PROCEEDINGS C98*, (2016) 11-14.
7. K. Saritha, **G. Phaneendra Reddy**, and K.T. Ramakrishna Reddy\*, **Studies on physical properties of SnSe<sub>2</sub> thin films grown by a two-stage process**, *Materials Today: Proceedings* 3 (2016) 4128–4133. <https://doi.org/10.1016/j.matpr.2016.11.085>

## Other Publications

1. Sumalatha Chevva **G. Phaneendra Reddy**, K.T.R. Reddy\*, “Deposition time effect on physical properties of Iron Disulfide (FeS<sub>2</sub>) thin films grown by Chemical Bath Deposition”, **International Journal for Research in Engineering Application & Management (IJREAM)**, 07(08) (2021) 68-72. DOI : 10.35291/2454-9150.2021.0590
2. T. Sreenivasulu Reddy, **G. Phaneendra Reddy**, K.T. Ramakrishna Reddy\*, **Electrical and Photoluminescence Properties of Mo-doped ZnO Films Deposited by Spray Pyrolysis**, **Materials Science Research India**, 15 (2018) 218–223. Doi: <http://dx.doi.org/10.13005/msri/150303>
3. K. Saritha, **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy, The effect of selenization temperature on morphological and structural properties of tin diselenide thin films grown by a two-stage process, **International Journal of Advanced Research in Physical Sciences**, 2 (2015) 39.
4. **G. Phaneendra Reddy**, K. Saritha and K.T. Ramakrishna Reddy, Synthesis and characterization of Cu<sub>2</sub>SnS<sub>3</sub> films grown by two-stage process, **International Journal of Advanced Research in Physical Sciences**, 2 (2015) 21.

## Papers Presented in International Conferences

1. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Effect of sulfurization time on the structural properties of Cu<sub>2</sub>SnS<sub>3</sub> films deposited by two-stage process*, International conference on “Actual Problems of Solid State Physics” **September 24-28, 2018**, Minisk, Belarus.
2. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Phase purity changes with sulfurization temperature in Cu<sub>2</sub>SnS<sub>3</sub> films grown by a two-step process for photovoltaic application*, Winter School-2017 on Frontiers in Materials Science, **December 04-08, 2017**, JNCASR, Bangalore, India.
3. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Preparation and characterization of Cu<sub>2</sub>SnS<sub>3</sub> thin films by two stage process for solar cell application*, International conference on Materials for Sustainable Future (ICMSF-2016), **July 14-15, 2016**, Sastra University, Thanjavur, India.
4. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Physical properties of Cu<sub>2</sub>SnS<sub>3</sub> thin films prepared by sulfurization of co-sputtered Cu-Sn metallic precursors*, 2<sup>nd</sup> International Conference on Solar Energy Photovoltaic, **December 17-19, 2016**, KIIT- Bhubaneswar, India.
5. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Investigation on physical properties of thermally evaporated SnS thin films*, Sustainable Energy Technologies for Smart & Clean Cities, (SETS & CC-2016), **July 27-29, 2016**, IIT-Tirupati. India.

## Papers Presented in National Conferences

1. P. Mallika Bramaramba Devi, **G. Phaneendra Reddy**, and K.T. Ramakrishna Reddy\*, *Structural properties of nanocrystalline PVA capped SnS thinfilms grown by CBD*, National seminar on “Recent advances in materials and chemical sciences, (RAMCS-2019)”. **March 28<sup>th</sup>, 2019**, Sri Venkateswara University, Tirupati. India.
2. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Sulfurization temperature effect on optical properties of Cu<sub>2</sub>SnS<sub>3</sub> thin films grown by two stage process*, National Conference on Novel Materials for Device application, NCNMDA-2018 **November 04-05, 2018**, Sri Venkateswara University, Tirupati. India.



3. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Sulfurization effect on optical properties of Cu<sub>2</sub>SnS<sub>3</sub> thin films grown by two step process*, Seminar on Science Communication, **November 13<sup>th</sup>, 2017**, SPMVV, Tirupati. India.
4. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Measurement of global and diffuse radiation using pyranometer in tirupati region*, Two day National Seminar cum Workshop on Solar Thermal and Photovoltaic Techniques, **October 05-06, 2017**, Madhurai Kamaraju University, Madhurai, India.
5. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Optical properties of Cu-Sn-S thin films prepared by two step process*, National Conference on novel materials and technologies, (NCNMAT-2017), **September 16-17, 2017**, Sri Venkateswara University, Tirupati. India.
6. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Sulfurization effect on optical properties of Cu<sub>2</sub>SnS<sub>3</sub> thin films grown by two stage process*, 61<sup>st</sup> DAE Solid State Physics Symposium, **December 26-30, 2016**, KIIT- Bhubaneswar, India.
7. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Formation of Cu<sub>2</sub>SnS<sub>3</sub> thin film by the sulfurization of sputtered Cu/Sn/Cu metallic precursors*, National Conference on Advanced functional Materials, (NCAFM-2016), **March 23-24, 2016**, Sri Venkateswara University, Tirupati. India.
8. **G. Phaneendra Reddy** and K.T. Ramakrishna Reddy\*, *Sulfurization time dependent physical properties of Cu<sub>2</sub>SnS<sub>3</sub> films*, National Symposium on Vacuum Technology and Its Applications to Electron Beams, (IVSNS-2005), **November 18-20, 2015**, TIFR, Mumbai.
9. **G. Phaneendra Reddy**, P. Babu, and K.T. Ramakrishna Reddy\*, *Chemical bath deposited ZnIn<sub>2</sub>Se<sub>4</sub> films for solar cell application*, Energy Security through New & Renewable Energy Resources, **July 27-29, 2015**, Sri Venkateswara University, Tirupati, India.
10. **G. Phaneendra Reddy**, M. Vasudeva Reddy, and K.T. Ramakrishna Reddy\*, *Effect of sputtering power on the structural properties of DC magnetron sputtered molybdenum films*, National conference of nanomaterials and instrumentation, (NCNI-2014), **March 09-10, 2014**, Kurukshetra, Haryana, India.

### **Lecture Series Programs Attended**

1. Participated in National Program on “Energy Materials: Synthesis to Application” December 01-07, 2015, Banarus Hindu University, Varanasi, U.P., India.
2. Participated in “CSR Lecture Series”, September 01-12, 2014, UGC-DAE-CSR, Indore, India.
3. Participated in “Seventh Science Conclave & Inspire Internship Program-2014” December 08-12, 2014. IIIT Allahabad, India.

### **Countries visited**

S. No	Country visited	From Date (DD/MM/YYYY)	To Date (DD/MM/YYYY)	Purpose of visit
1	UK	21/03/2015	20/04/2015	Research
2	UK	30/09/2016	10/10/2016	Research

### ***Workshops Attended***

1. Participated in National “A one-day Workshop on Ferrites: Synthesis, Characterization & Applications”, July 28<sup>th</sup>, 2019. Jawaharlal Nehru Technological University Anantapur, Andhra Pradesh, India.
2. Participated in National “Short term Course on Computation Design for Energy Application”, August 09-11, 2017. Hindustan University, Chennai, India.
3. Participated in “Initiating Change & Dialogue within the SVU Community to Improve Research & Development”, June 28-29, 2016. Sri Venkateswara University, Tirupati, India.
4. Participated in Acquaintance Program of “Applications of Accelerators based research”, October 9<sup>th</sup>. 2015, Acharya Nagarjuna University, Guntur, India.
5. Participated in “National Workshop on Recent Trends in X-ray Diffraction Techniques (NWRTXRD-2015)”, May 29-30, 2015, Osmania University, Hyderabad, India.
6. Participated in “INUP Familiarization Workshop on Nanofabrication Technologies”, November 28-30, 2014, IIT Bombay, Mumbai, India.
7. Participated in one day workshop on “Nano Metrology and Material Characterization” 25<sup>th</sup> June 2014, C.M.T.I., Bangalore - 560022, India.
8. Participated in “Short term course on nanomaterials: synthesis and characterization (STC-2014)” NIT Kurukshetra, Haryana. India.

### ***Memberships in***

- The Indian Science Congress Association
- Solar Energy Society of India
- Supergen Supersolar (The network for solar research in the UK)

### **Research Interests:**

- Design and synthesis of nanostructured materials for photovoltaic, photocatalytic/ Electro-catalytic H<sub>2</sub> production and **sensors** and **super capacitor** applications.
- Synthesis of advanced nanomaterials using chemical – Co-precipitation, hydrothermal/ solvothermal, combustion and sol – gel methods.
- Characterization of nanomaterials using XRD, SEM, EDS, TEM, HRTEM, XPS, UV-Vis DRS, Photoluminescence, Electrical Impedance and Photoelectrochemical etc.
- Fabrication of miniaturized nanocomposites for energy storage and fuel cells applications.

### ***Technical contest***

- Qualified in DST-Texas India innovation challenge Design contest 2018, Anchored by IIM, Bangalore, India.

## Skills Acquired

- ✿ Ability to work with a team as well as independently to successfully construct research programmes. Commendable experimental skills on the preparation of thin film solar cell materials [Absorber, Buffer, Window layers and Contacts] and also acquired knowledge in the preparation of thin films using several techniques like
  - ◆ Sputtering (DC/RF)
  - ◆ Evaporation (Thermal/Electron beam)
  - ◆ Sulfurization and Selenization (Single-zone/Two-zone)
  - ◆ Chemical bath deposition
  - ◆ Spray pyrolysis
  
- ✿ Well versed in interpretation of the graphical and data analysis of material characterization techniques like
  - ✓ X-ray photoelectron spectrometer (XPS)
  - ✓ Raman spectrometer
  - ✓ X-ray diffraction (Powder, single and high resolution XRD)
  - ✓ SEM/FE-SEM attached with EDS
  - ✓ Atomic force microscopy (AFM)
  - ✓ Fourier-transform infrared spectroscopy (FTIR)
  - ✓ UV-Vis-NIR spectroscopy
  - ✓ Electrical properties like Hall Effect
  
- ✿ Good command on research software's such as Origin Pro 8.5 and Powder X Full Prof. Adequate knowledge on the preparation of manuscripts, paper presentations, project proposals and report making.

## As a Reviewer

- 1) The Journal of Optoelectronics and Advanced Materials (J. Optoelectron. Adv. M.)
- 2) Materials Science and Chemical Engineering (MSCE)

## Referees

<b>1. Prof. K.T. Ramakrishna Reddy</b> Department of Physics Sri Venkateswara University, Tirupati – 517 502, Andhra Pradesh – India. <b>Mob: +91-94411 37898</b> <b>E-mail:</b> <a href="mailto:ktrkreddy@gmail.com">ktrkreddy@gmail.com</a>	<b>2. Dr. M. Vasudeva Reddy</b> International Research Professor College of Engineering Yeungnam University, Gyeongsan38541, South Korea. <b>Mob: +82-10-6289-0018</b> <b>E-mail:</b> <a href="mailto:drmvasudr9@gmail.com">drmvasudr9@gmail.com</a>	<b>3. Dr. Guillaume Zoppi</b> Associate Professor Department Physics and Electrical Engineering, Northumbria University Newcastle Upon Tyne, UK. <b>Mob: +44-0191 243 7013</b> <b>E-mail:</b> <a href="mailto:guillaume.zoppi@northumbria.ac.uk">guillaume.zoppi@northumbria.ac.uk</a>
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