



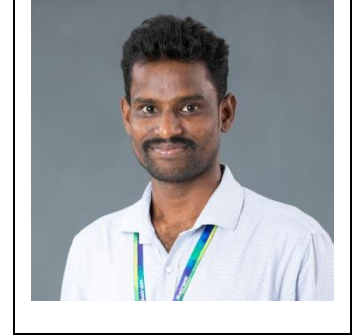
# Sri SAI RAM INSTITUTE OF TECHNOLOGY

An ISO 9001 : 2008 Certified Institution

Sai Leo Nagar, West Tambaram, Chennai - 44. www.sairamit.edu.in

## DEPARTMENT OF PHYSICS

Name : Dr.E.VISWANATHAN  
Designation : Assistant Professor  
Email : viswanathan.phy@sairamit.edu.in  
Qualification : M.Sc., Ph.D., TNSET.,  
Specialization : Physics  
Research Interest : Condensed Matter Physics



Experience in years : **Teaching** UG  PG  **Industry**

No. of Workshop/Conferences/  
FDP attended : Workshop  Conferences  FDP

No. of Workshop/Conferences/  
FDP Organized : Workshop  Conferences  FDP

Professional Membership	1. Member in IEEE
Publications	International Journal : 8
	National Journal : 3
	Others : 13
Research Funded Projects	-
Patents	-
Achievements	Received Best Firer Award during the Pre-Commission course for Associate NCC Officer during 12 <sup>th</sup> Aug to 9 <sup>th</sup> Sep, 2023 at NCC-OTA, Kamptee
Any Other Information	Anna University recognized supervisor to guide Ph.D. scholars

## Additional Qualification

1. Cleared TNSET 2017 for the eligibility of Assistant Professor in Tamilnadu – Conducted by Mother Teresa Women's University.
2. Completed Pre-Commission course for Associate NCC Officer during 12<sup>th</sup> Aug to 9<sup>th</sup> Sep, 2023 at NCC-OTA, Kamptee and commissioned as Lieutenant.

## Teaching and Research Experience

2019-2020	Assistant Professor, Department of Physics, National College, Trichy
2013-2016	Junior Research Fellow in DST-SERB, India funded Project, Sathyabama University, Chennai
2013-2019	Lab Assistant - M.Sc Physics Laboratory Sathyabama University, Chennai
2017-2019	Instrument Handling in DST-FIST Lab (TGA, FTIR), Sathyabama University, Chennai

## Publications.

1. Manjula M, Krishnaveni S, **Viswanathan E**, Muthumari M, Influence of Rb doping in optical and thermoelectric properties of KCl – A DFT approach, Materials Today: Proceedings, 50, 7, 2729-2736, 2022, <https://doi.org/10.1016/j.matpr.2020.08.271>.
2. Priyadarshini S., Sundareswari M., **Viswanathan E**, Jayalakshmi D S, Manjula, M., Band engineering of modified rhombohedral Cu<sub>4</sub>Mn<sub>2</sub>Te<sub>4</sub>:ab initio approach, Philosophical Magazine, 102, 13, 1261-1289, 2022, <https://doi.org/10.1080/14786435.2021.2023774>.
3. Manjula M, **Viswanathan E**, Muthumari M, Pradheepa K, Dhivyabharathi R, Shalini L, Kuznetsov Denis, Veluswamy Pandiyarasan, Lifting the Optical and Thermoelectric Properties of Mg<sub>2</sub>Si as a Function of Sn Incorporation—Potential Thermoelectric Materials, ECS Journal of Solid State Science and Technology, 10, 7, 071023, 2021, <https://doi.org/10.1149/2162-8777/ac1479>.
4. Jayalakshmi D S, **Viswanathan E**, Sundareswari M, Hemanand D, Theoretical investigation of thermoelectric property and damage tolerance of LuB<sub>2</sub>C<sub>2</sub> compound, Computational Condensed Matter, 2021, 28, e00566. <https://doi.org/10.1016/j.cocom.2021.e00566>.
5. Muthumari M, Manjula M, Sundareswari M, **Viswanathan E**, Investigation on half-metallic ferromagnetism in Phosphorous doped SmN-Band structure study, Journal of Physics: Conference Series, 1770, 1, 012093, 2021, <https://doi.org/10.1088/1742-6596/1770/1/012093>.
6. Manjula M, Malliga P, **Viswanathan E**, Muthumari M, Ab-initio investigations of electronic, optical, mechanical and thermal properties of Ca<sub>0.875</sub>Ba<sub>0.125</sub>Te, Journal of Physics: Conference Series, 1770, 1, 012094, 2021, <https://doi.org/10.1088/1742-6596/1770/1/012094>.
7. Priyadarshini S, Sundareswari M, **Viswanathan E**, First principles band structure investigation of cubic spinel CuMn<sub>2</sub>Te<sub>4</sub> Compound for thermoelectric applications, Journal of Physics: Conference Series, 2070, 1, 012037, 2021, <https://doi.org/10.1088/1742-6596/2070/1/012037>.
8. Jayalakshmi D S, Sundareswari M, **Viswanathan E** and Leena Josphine, “Lifshitz transition on SrFe<sub>2</sub>As<sub>2</sub> and SrFe<sub>2</sub>Bi<sub>2</sub> compounds under pressure”, Proceedings of the Indian National Science Academy, 86, 3, 1279-1286, 2020. <https://doi.org/10.16943/ptinsa/2019/49671>.
9. M.Manjula, S.Krishnaveni, **E.Viswanathan**, M.Muthumari, “Influence of Rb doping in optical and thermoelectric properties of KCl – A DFT approach”, Materials Today Proceedings, Accepted on 5-10-2020. <https://doi.org/10.1016/j.matpr.2020.08.271>.
10. D. S. Jayalakshmi, M. Sundareswari, **E. Viswanathan**, D. Hemanand and Venkat Pranesh, “Computational study on unconventional superconductivity and mechanical properties of novel antiferrromagnetic (Ca,Sr,Ba)Fe<sub>2</sub>Bi<sub>2</sub> compounds”, International Journal of Modern Physics B, 33, 28, 1950341, 2019. <https://doi.org/10.1142/S0217979219503417>.
11. **E.Viswanthan**, M.Sundareswari, S.Krishnaveni, M.Manjula, D.S.Jayalakshmi, “Theoretical Investigation on Effect of Boron on Improving the Hardness of Cubic Zincblende-Aluminium

- Nitride and Its Mechanical, Thermal and Thermoelectric Properties”, *Journal of Superhard Materials*, 41, 5, 321-333, 2019. <https://doi.org/10.3103/S1063457619050046>.
12. D.S.Jayalakshmi, M.Sundareswari, **E.Viswanathan**, “Theoretical Prediction of Possible Coexistence of Superconductivity and Antiferromagnetism in Novel SrFeRuBi<sub>2</sub>, SrRu<sub>2</sub>Bi<sub>2</sub> and Parent SrFe<sub>2</sub>Bi<sub>2</sub> Compounds”, *Scientific Bulletin series A*, 81, 2, 221-232, 2019. [https://www.scientificbulletin.upb.ro/rev\\_docs\\_arhiva/fullcac\\_116981.pdf](https://www.scientificbulletin.upb.ro/rev_docs_arhiva/fullcac_116981.pdf).
  13. **E.Viswanathan**, M.Sundareswari, D.S.Jayalakshmi, M.Manjula, “Fermi Surface and Hardness Enhancement Study on Ternary Scandium and Vanadium Based Borides by First Principles Investigation”, *Computational Materials Science*, 157, 107-120, 2019. (<https://doi.org/10.1016/j.commatsci.2018.10.040>).
  14. D.S.Jayalakshmi, M.Sundareswari, **E.Viswanathan**, Abhijeet Das, “Theoretical investigation on thermoelectric properties of (Ca,Sr, Ba)Fe<sub>2</sub>(As,Bi)<sub>2</sub> compounds under temperature”, *AIP Conference Proceedings*, 1951, 020002-1 – 020002-7, 2018. (<https://doi.org/10.1063/1.5031710>).
  15. M.Manjula, M.Sundareswari\* and **E.Viswanathan**, “Effect of Zr substitution on the thermal and mechanical properties of Rh<sub>3</sub>A (A=Nb,Ta) – A theoretical study”, *AIP Conference Proceedings*, 1951, 030015-1 – 030015-7, 2018. (<https://doi.org/10.1063/1.5031741>).
  16. M.Manjula, M.Sundareswari and **E.Viswanathan**, “Elastic and Thermodynamic Properties of Zirconium and Hafnium doped Rh<sub>3</sub>V Intermetallic Compound- Potential Aerospace Material, *Bulletin of Materials Science*, 41, 19, 2018. (<https://doi.org/10.1007/s12034-017-1537-3>).
  17. **E.Viswanathan**, M.Sundareswari, D.S.Jayalakshmi, M.Manjula, S.Krishnaveni, ”Structural, electronic, mechanical, thermal and optical properties of B(P,As)<sub>1-x</sub>N<sub>x</sub>; (x=0, 0.25, 0.5, 0.75, 1) alloys and hardness of B(P,As) under compression using DFT calculations, *Indian Journal of Physics*, 91, 9, 999-1011, 2017. (<https://doi.org/10.1007/s12648-017-0996-0>).
  18. M.Manjula, M.Sundareswari, **E.Viswanathan**, “Enhancement of ductility in cubic Rh<sub>3</sub>A<sub>x</sub>Ti<sub>1-x</sub>(A= V, Nb, Ta)(x= 0, 0.125, 0.25, 0.75, 0.875, 1) aerospace materials – First principles DFT study, *Materials Chemistry and Physics (Elsevier)* 1, 9, 1-9, 2016. (<https://doi.org/10.1016/j.matchemphys.2016.06.037>).
  19. M.Sundareswari, D.S.Jayalakshmi and **E.Viswanathan**, A first principles study on newly proposed (Ca/Sr/Ba)Fe<sub>2</sub>Bi<sub>2</sub> compounds with their parent compounds, *Philosophical Magazine*, 96, No 5, pp, 511-523, 2016. <https://doi.org/10.1080/14786435.2016.1140911>).
  20. R.Sugan Harish, D.S.Jayalakshmi, **E.Viswanathan** and M.Sundareswari, Structural stability, electronic, mechanical and thermo dynamical properties of CaNi<sub>2</sub>P<sub>2</sub> and CaNi<sub>2</sub>Sb<sub>2</sub> compounds by band structure calculations, *Modern Physics Letters B*, 30, No.12, 1650178, 2016. (<https://doi.org/10.1142/S0217984916501785>).
  21. **E.Viswanathan**, M.Sundareswari, Study on structural, electronic and elastic properties of boron arsenide doped with nitrogen using density functional theory, *Journal of Chemical and Pharmaceutical Sciences*, Spl Iss. 11, 11-14, 2015. ([https://www.jchps.com/specialissues/Special\\_issue\\_11/jchps\\_4\\_E.Viswanathan\\_11-14.pdf](https://www.jchps.com/specialissues/Special_issue_11/jchps_4_E.Viswanathan_11-14.pdf)).
  22. **E.Viswanathan**, M.Sundareswari, D.S.Jayalakshmi and M.Manjula, Theoretical investigation on structural and electronic properties of PdO<sub>2</sub>, *AIP Conference Proceedings*, 1665, 090047, 2015. (<https://doi.org/10.1063/1.4918027>).
  23. S. Krishnaveni, M. Sundareswari and **E.Viswanathan**, Computational study of structural and electronic property of the predicted compound-Os<sub>2</sub>TiBi, *Journal of Chemical and Pharmaceutical Research*, 2015, 7(2):378-380. (<http://www.jocpr.com/articles/computational-study-of-structural-and-electronic-property-of-the-predicted-compound-os2tibi.pdf>).
  24. M.Manjula, M.Sundareswari, D.S.Jayalakshmi and **E.Viswanathan**, Theoretical investigation on improving the ductility of Rh<sub>3</sub>V by ternary addition, *AIP Conference Proceedings*, 1665, 090046, 2015. (<https://doi.org/10.1063/1.4918026>).

## Books

1. Jayalakshmi, D.S., Sundareswari, M., **Viswanathan, E.**, Das, Abhijeet Das, Thermoelectric properties of BaFe<sub>2</sub>As<sub>2</sub> and Ba<sub>2</sub>FeAs<sub>2</sub> Compounds, Scholar's Press, pp 1-56, 2018, ISBN-978-620-2-31424-4. (<https://www.morebooks.de/store/gb/book/thermoelectric-properties-of-bafe2as2-and-ba2feas2-compounds/isbn/978-620-2-31424-4>).

## **Worganized/tutored**

1. As a co-convener organized a CSIR sponsored summer workshop on “Modelling and Simulation in Materials Science and Engineering” with hands on session (MSME 2018), during 18-22, June 2018, at the Department of Physics, Sathyabama Institute of Science and Technology, Chennai—119.
2. Acted as a tutor in the CSIR Sponsored Winter School on Computational Modelling (WISCOM-2020) during 27-29, Feb, 2020 held at PG & Research Department of Physics, Holy Cross College, Trichy.

## **Reviewer**

1. Reviewer in a ‘International Journal of Computational Materials Science and Engineering.

## **Award**

1. Received best firer award during the Pre-Commission course for Associate NCC Officer during 12<sup>th</sup> Aug to 9<sup>th</sup> Sep, 2023 at NCC-OTA, Kamptee.

## **Major Workshop/Internship/School Attended**

National Work Shop On “Advanced Techniques Related To Analytical, Molecular, Material Testing And Statistical Tools” ( NWAT-2018)	27th -29th March 2018 Andhra University
Participated in “INDO-French Workshop on Pressure Effects on Strongly Correlated Materials IWPEscM17”	9-12, January 2017 Bharathidasan University
Participated in the SERB School on “ Density Functional Theory and Beyond: Computational Materials Science and Materials Design”	24 <sup>th</sup> November – 13 <sup>th</sup> December 2014 The M.S. University of Baroda
Summer Internship Programme (Summer School & Project)	16 <sup>th</sup> May – 15 <sup>th</sup> July, 2011. Indian Institute of Astrophysics
“Third Science Conclave-2010 Interaction Programme with Noble Laureates”	8-14 Dec – 2010 Indian Institute of Information Technology, Allahabad, UP.

## **Major Conferences/ Seminar/ Guest Lecture Attended**

Advances in Refractory and Reactive Metals and Alloys(ARRMA 2016)	27-29, January 2016 Bhabha Atomic Research Centre.
Preconference Meet with Nobel Laureate Dr. Walter Kohn (ICRAPID 2014)	5-6, December 2013 Sathyabama University.
One day training programme on“Effective Teaching”	24 <sup>th</sup> January, 2017 IQAC, Sathyabama University
National Seminar on “Quality Higher Education 2017”	28-29, April 2017 IQAC, Sathyabama University.

## **Conference presented**

(Oral) Presented in one day seminar on “ Sensors” entitled “Synthesis and characterization of Nanoporous Pigment for the Identification of Hazardous air pollution”	28 <sup>th</sup> October 2017. MIT Campus, Anna University
(Oral) Presented in TEQIP-II Sponsored International Conference on Recent Advancements in Materials (ICRAM-2015) entitled (Study on Structural, Electronic and Elastic Properties of Boron Arsenide Doped with	16-17, October 2015 Trichy Campus, Anna University

Nitrogen Using Density Functional Theory)

(Poster) 59th DAE Solid State Physics Symposium –  
Presented a paper “ Theoretical Investigation on  
structural and electronic Properties of PdO<sub>2</sub>”

16-20, December 2014  
VIT University, Vellore.

### **Academic Workload**

2. Theory Papers Handled for I B.E/B.Tech Students

Engineering Physics, Physics for Information Science, Physics of Materials and  
Physics of Electronic Devices

3. Laboratory Handling

Major Laboratory – I yr B.E/B.Tech Students

### **Technical Skills**

4. Working experience with software packages like Wien2k, VASP, Origin and  
Xcrysden.

5. Hands on experience with operating system like Windows and Cent OS

### **Research Interest**

With the trustworthy computational codes and effective ab initio density functional theory, computational materials science plays a major role in predicting material's properties. In many areas, the computations reached an appreciable level of accuracy often analogous to the experimental data. These theoretical models play a key role in trends of correlating properties of materials and provide clue for the synthesis of novel class of materials.

I am working on superhard materials especially covalent bonded crystalline materials such as borides, nitrides and carbides. Hardness is very resourceful and a quick strength probe among the mechanical properties. Though the hardest superhard materials like diamond and cBN find excellent applications, its disadvantages lead to necessity of development of alternate superhard materials.

I am using Wien2k and VASP package to study the band/electronic structure calculation and also other properties such as structural changes under pressure, Fermi surface for metals, mechanical properties like stiffness coefficients, elastic moduli namely Young's, bulk and shear modulus and Poisson's ratio, Pugh's ratio, Cauchy's criteria, Kleinman parameter, Cauchy and Born ratio, anisotropy, hardness, ductility/brittleness, thermal properties like Debye temperature, elastic wave velocity, melting temperature, transport properties like Seebeck coefficient, electrical conductivity/resistivity, electronic thermal conductivity, optical properties like real and imaginary part of dielectric constant, refractive index, extinction coefficient, reflectivity, etc.