

# K VENKATESH

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## RESEARCH INTERESTS

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Materials in renewable energy technologies  
Computational materials science

Multi-scale modeling  
Process modeling

## EDUCATION

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**Indian Institute of Technology Madras**

Dual degree (B.Tech + M.Tech)

Metallurgical & Materials Engineering

*July 2013 - Present*

Overall GPA: 9.19/10

Major GPA: 9.51/10

## ACADEMIC ACHIEVEMENTS

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Secured 10/10 GPA in 8<sup>th</sup> semester

Topped school in class 12 board examinations

Awarded Ministry of Steel Scholarship for outstanding academic performance

Secured all India rank 397 (amongst 1,200,000 candidates) in JEE Mains 2013

## RESEARCH EXPERIENCE

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**Synthesis of doped  $\text{Na}_x\text{TiO}_2$  for Sodium-ion battery anode**

*Guide: Dr. Bijoy K Das*

June 2018 - July 2018

*Summer internship, ARCI*

- Synthesized and characterized  $\text{Na}_x[\text{Co}_y\text{Ti}_{1-y}]\text{O}_2$  layered oxides using co-precipitation method
- Studied electrochemical performance of the oxide as anode in Sodium-ion half-cell

**Multi-scale modeling of resistance spot welding**

*Guide: Dr. Murugaiyan Amirthalingam*

July 2017 - May 2018

*Master's project*

- Developed analytical expressions for a parametric and non-parametric interface resistance model and incorporated them in COMSOL Multiphysics to simulate resistance spot welding process
- Validated interface resistance models with data from literature
- Simulated single and multi-pulse resistance spot welding using finite element method

**Elimination of weld defects during ultrasonic consolidation**

*Guide: Dr. G D Janaki Ram*

June 2016 - July 2016

*Summer internship, IIT Madras*

- Identified optimal ultrasonic consolidation process parameters and fabricated specimens
- Modified base plate design to enable friction stir processing of defective section of the specimen
- Identified friction stir processing parameters that ensure defect-free stir zone
- Performed friction stir processing and confirmed defect elimination through microstructure analysis

**Synthesis and characterization of  $\text{Y}_2\text{Ti}_2\text{O}_7$**

*Guide: Dr. B S Murty*

May 2017-June 2017

*Summer internship, IIT Madras*

- Synthesized  $\text{Y}_2\text{Ti}_2\text{O}_7$  using ball milling+heat treatment, solid state reaction and flame spray pyrolysis
- Characterized the powders using X-ray diffraction and particle size analysis
- Prepared ODS steel pellets using ball milling followed by spark plasma sintering
- Performed hardness and hot compression tests to study high temperature mechanical behavior

## SKILLS

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<b>Computer Languages</b>	C, C++
<b>Software packages</b>	ThermoCalc, COMSOL Multiphysics, MICRESS, XPert Highscore MATLAB, ParaView, Origin, JMatPro, AutoCAD
<b>Operating systems</b>	Windows, Linux

## RELEVANT COURSES

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Computational Materials Thermodynamics	Energy Storage Systems & Devices
Computational Techniques in Materials Science	Materials in Renewable Energy Technologies
Computational Materials Engineering Lab	Physics of Materials
Numerical methods for metallurgists	Advanced Materials & processes

## EXTRA-CIRRICULAR ACTIVITIES

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### Social responsibility

- Led a 3 member team in the installation of DC-based inverter-less solar electrification technology developed at IIT Madras in Government Girls Higher Secondary School, Ashok Nagar, Chennai
- Led a 3 member team in conducting water quality tests, identifying best technology commercially available for drinking water purification at Vedal village and preparing proposal for funding
- Led a 3 member team in conducting technology research, feasibility study & technical analysis for solar electrification of Uluru Children's home, Kadappakkam and preparing proposal for funding
- Initiated project to provide free education to students from disadvantaged communities

### Quizzing

- Secured 1<sup>st</sup> prize in aeronautics quiz competition conducted by Aeronautical Society of India
- Secured 1<sup>st</sup> prize in optics quiz conducted by SPIE International School of Photonics chapter
- Secured 1<sup>st</sup> prize in state level Encon club quiz conducted by Bharat Petroleum Corporation Ltd

### Miscellaneous

- Professionally trained in South Indian classical music and flute
- Tutored and mentored 21 freshmen in maths and physics, and provided holistic guidance