

Sai Rama Krishna Malladi



Contact

Address:

207, MSME Building, Indian Institute of Technology Hyderabad, Kandi, Sanga Reddy, Telangana 502 284

Phone:

+91 73370 37776

Email: srkm@msme.iith.ac.in

Languages

- English and Hindi – speak fluently and read/write with high proficiency.
- Dutch – Basic understanding and limited communication skills
- Telugu – Native language

Summary

Associate Professor in the Department of Materials Science & Metallurgical Engineering specialising in the area of transmission electron microscopy (TEM) with a keen interest in understanding and visualizing the structure-property relationships in materials using *in situ* TEM techniques.

- Over *twelve* years' hands-on experience handling aberration-corrected TEMs, dual-beam SEM-FIB, and other relevant scientific equipment
- Clean room user with experience in the areas of nanofabrication using optical lithography, wet bench processing, reactive ion etching, and thin-film deposition using evaporation and sputtering.
- Extensive experience in materials science and metallurgy: published several peer-reviewed articles in top-ranked journals and conferences.

Experience

Associate Professor - 07/2025 – Present

Assistant Professor - 02/2017 – 07/2025

*Department of Materials Science & Metallurgical Engineering,
Indian Institute of Technology Hyderabad*

- Primary research interests include the development and application of in-situ electron microscopy for various Materials related problems. Currently, my group's research focuses on two domains:
 - Liquid cell electron microscopy with applications ranging from investigating the nucleation and growth of nanoparticles to understanding the charges at solid-liquid interfaces using both static graphene-based liquid cells and MEMS-based liquid flow holders.
 - In situ and Ex Situ Corrosion Studies of Metallic Alloys and Materials for Energy applications.

Visiting Scientist - 02/2015 – Present

*Ernst Ruska Centre for Microscopy and Spectroscopy with Electrons
Forschungszentrum Jülich, Jülich, Germany*

- Been working as a visiting scientist during summers on applications of phase contrast imaging, particularly electron holography for *in situ* TEM systems.

Post-doctoral Researcher - 12/2013 -12/2016

Kavli Institute of Nanoscience, Delft University of Technology

Developed an improved TEM holder and gas flow system to study gas-material interactions *in situ* in a reliable way.

- The study's main objective was to overcome the challenges involved in obtaining leak-tight gas nanoreactors, reducing contamination and assembling the nanoreactors in a reproducible and reliable way.

Developed MEMS based liquid cells for *in situ* TEM studies

- Gained ample clean room experience to design and fabricate MEMS-based devices using optical lithography, wet chemical methods, and other sophisticated techniques involving reactive ion etching, and thin film deposition methods, such as sputtering and evaporation, to name a few.

Ph.D. Researcher - 09/2009 - 12/2013

Kavli Institute of Nanoscience, Delft University of Technology

- Worked on the adaptation, processing and improvement of nanoreactors for carrying out *in situ* TEM studies in a gas-liquid mixture (aerosol) to study the corrosion of Al alloys at the nanometer scale, as part of Prof. Henny Zandbergen's research team. This project was supported by Materials Innovation Institute (M2i).

Experience (Contd.)

Ph.D. Research - 09/2009 - 12/2013

Kavli Institute of Nanoscience, Delft University of Technology

- Studied the influence of heat-treatment on the development of microstructures in precipitation hardened Al alloys (AA 2024).
- Established, for the first time, the link between the early stages of precipitation in an Al matrix at the atomic scale using HRSTEM imaging and *in situ* heating.
- Developed a *quasi in situ* TEM method to investigate the intermediate stages of localized corrosion in Al alloys; this method is an essential complement to *in situ* TEM studies, and is also needed to understand the mechanism of a chemical reaction (not just corrosion) by tracking the intermediate stages of a specimen.
- Gained expertise and mastered all the operational modes on FEI microscopes, specifically aberration corrected TITAN, monochromated Tecnai F-20, and operated in scanning/transmission modes coupled with EELS, EFTEM, EDX analysis.

Graduate Student - 07/2007 - 07/2009

Indian Institute of Technology Kanpur

- Optimized the deposition parameters for porosity-free, specular nanocrystalline Ni coatings using pulsed electrodeposition.
- Characterized Ni coatings by XRD, SEM, AFM, EBSD & TEM.
- Investigated the nature of the passivation layer on these coatings by common electrochemical characterization techniques like linear polarization, potentiodynamic polarization and electrochemical impedance spectroscopy.

Teaching and Mentoring Experience:

TEACHING EXPERIENCE:

03/2017 - Present

Indian Institute of Technology Hyderabad

- Instructor, "Practical Approach to Transmission Electron Microscopy"
 - Trained 59 PhD students from *nine* departments at IIT Hyderabad on the practical applications and theoretical introduction to Transmission Electron Microscopy.
- Courses taught at IIT Hyderabad in this period (17): Variants of Crystallography, Electron Microscopy, Introduction to Materials Science and Engineering, Applications of Electrochemistry in Materials Science and Engineering, Corrosion, Materials Selection and Design, Extractive Metallurgy.

09/2010 – 12/2016

Delft University of Technology, The Netherlands

- Instructor, "Structural studies of high T_C -superconductors"
 - *Research Practicum* course for undergraduate students to learn and understand the synthesis and characterization of a high temperature superconductor, yttrium barium copper oxide ($YBa_2Cu_3O_7$) using transmission electron microscopy
- Trained and mentored *six* Ph. D students on various advanced transmission electron microscopy techniques.

MENTORING EXPERIENCE:

03/2017 - Present

Indian Institute of Technology Hyderabad

- Postdocs: None
- Ph. D Students (**11**):
 - Completed/nearly completed (2):
 - 1) Mr. Govind Ummethala
 - 2) Mr. Jaydeep Saha (co-supervised)
 - Ongoing (8):
 - 1) Mr. Adirae Dinesh,
 - 2) Mr. Sri Harsha Molleti (co-Supervising):
 - 1) Mr. Arka Jyoti Roy,
 - 2) Ms. Sivani NJL,
 - 3) Mr. Suresh Vanguri,
 - 4) Mr. Sandeep Devadula,
 - 5) Mr. Sunil Gudur,
 - 7) Ms. Barkha Awasti

Teaching and Mentoring Experience (Contd.):

MENTORING EXPERIENCE:

03/2017 - Present

Indian Institute of Technology Hyderabad

- M. Tech Students (6):
 - Completed (4):
1) Mr. Navneeth, 2) Mr. Valava, 3) Mr. Ajai Raj, 4) Mr. Sanjaya Kumar Pradhan 5) Mr. Nagaarjun Sridhar, 6) Mr. Ganesh Pandiyan
 - Ongoing (3):
1) Mr. Adithya Panda, 2) Mr. Kartik Iyer, 3) Vignesh V S
- B. Tech Students, Minors Project (5):
 - 1) Mr. G. Ashish Kumar, 2) Mr. Saurabh Satpute, 3) Ms. Siri Chandana, 4) Mr. Saketh RLN, 5) Mr. Bharadwaj Peela

09/2010 – 12/2016

Delft University of Technology, The Netherlands

- Mentored PhD student, Y. Kabiri, during his PhD studies on “*In situ* TEM studies of DNA dynamics”
 - Cleanroom mentoring: fabrication of *in situ* TEM MEMS devices
 - TEM mentoring: Image correction, STEM imaging and EELS analysis and general TEM knowhow and help with experimental planning and analysis
- Mentored *two* undergraduate students for their bachelor’s projects
 - Jelle Stap with his thesis entitled “Quasi *in situ* analytical TEM studies on cerium-based corrosion inhibition of aluminum alloy 2024-T3”
 - Dieter Matton with his thesis entitled “Studies on grain growth in thin Pt films and nanobridges”
- Co-supervised *four* groups of *six* students each, for EEP & PEP projects on “Transferable thin films for TEM applications” and “Liquid Cells for Electron Microscopy Applications”

07/2007 – 07/2009

Indian Institute of Technology Kanpur

- Mentored *three* undergraduate students for their bachelor’s thesis and *eight* undergraduate summer projects in the area of electrochemistry and corrosion

Education:

Doctor of Philosophy in Applied Physics.

Delft University of Technology, Delft, The Netherlands

Dissertation title: In situ transmission electron microscopy studies on aluminum alloys.

Supervisor: Prof.dr. H.W. Zandbergen

M.Tech in Materials Science and Engineering

Indian Institute of Technology Kanpur, Kanpur, India

Dissertation title: Novel Polarization Method for Optimizing Electrodeposition of Specular Nanocrystalline Nickel

10.0/10.0 (Perfect CPI), First Rank

Supervisor: Prof.dr. R. Balasubramaniam (deceased)

B.Tech. in Materials and Metallurgical Engineering

Mahatma Gandhi Institute of Technology, Jawaharlal Nehru Technological University, Hyderabad, India

First class with Distinction

Recognition:

2024 - Excellence in Microscopy Award for the year 2023 by Electron Microscope Society of India (EMSI)

2022 – Reviewer appreciation certificate from Journal of Alloys and Compounds for the year 2021

2021 - Recipient of the institute award for teaching excellence for the year 2021.

2020 – Co-convener for the 12th Asia Pacific Microscopy Congress (APMC 2020)

2017 – Associate Fellow, Andhra Pradesh Akademi of Sciences.

2011 – M2i poster prize for best applicable value, M2i Conference 2011.

2008 – Award for Academic Excellence for securing perfect score of 10.0/10.0, Indian Institute of Technology Kanpur.

PEER-REVIEWED ARTICLES:

- 1 Govind Ummethala, Amir H Tavabi, Shibabrata Basak, Hongyu Sun, H Hugo Pérez Garza, Rüdiger-A Eichel, Rafal E Dunin-Borkowski, **Sai Rama Krishna Malladi***, "Strategies for overcoming the practical challenges and failures while performing liquid cell transmission electron microscopy", (***corresponding author**), under review
- 2 Prusty, Mitali; Molleti, Sri; Hiroto, Takanobu; Malladi, Sai Rama ; Tang, Xin; Sepehri-Amin, Hossein. Reduced hysteresis in La_{0.7}Ce_{0.3}Fe_{11.5}Si_{1.5} hydrides by grain size reduction, Science and Technology of Advanced Materials, accepted
- 3 Roy, A. J., Malladi, S. K., & Dutta-Gupta, S. (2025). Thermally Driven Resonance Tuning in Nanobipyramid Plasmonic Substrates. Journal of Materials Chemistry C.
- 4 Das, I.M., Kumar, H., Nagini, M., Malladi, S.K., Makineni, S., Rajulapati, K.V., Mandal, A. and Gollapudi, S., 2025. Microstructure and mechanical properties of an aluminium composite with carbon-containing medium entropy alloy MoNbWTa_{0.5}Co_{0.5} reinforcement. Intermetallics, 182, p.108776.
- 5 Govind Ummethala, Ravi Jada, Shourya Dutta-Gupta, Junbeom Park, Amir H Tavabi, Shibabrata Basak, Robert Hooley, Hongyu Sun, H Hugo Pérez Garza, Rüdiger-A Eichel, Rafal E Dunin-Borkowski, **Sai Rama Krishna Malladi***. "Real-time visualisation of fast nanoscale processes during liquid reagent mixing by liquid cell transmission electron microscopy", *Nature Communications Chemistry* (2025), Accepted IF 5.9 Q1 (***corresponding author**)
- 6 Ummethala, Govind, Pravallika Bandaru, Subhradeep Chatterjee, Shourya Dutta-Gupta*, and **Sai Rama Krishna Malladi***. "A study of the spinodal decomposition of AgCu alloy films using in situ transmission electron microscopy." *Materials Characterization* 216 (2024): 114297. IF 5.1 Q1 (***corresponding author**)
- 7 Paremmal, Priyesh, K. Sairam, Soumya Ranjan Mishra, U. Govind, **S. R. K. Malladi**, Shourya Dutta-Gupta, MS Ramachandra Rao, and B. S. Murty. "Effect of Zr content on the strain rate sensitivity of nanohardness of Ti-Zr-Cu-Ni-Al thin film metallic glass." *Surface and Coatings Technology* 478 (2024): 130370. IF 5.7 Q1
- 8 Pradeep, V. V., Ummethala, G., **Malladi, S. R. K.***, & Chandrasekar, R*. (2023). Focused Ion Beam Milling of Perylene Microcrystals into Photonic Modules: Effect of Substrate and the Ion Beam Current. *Crystal Growth & Design*. IF 3.3 Q2 (***corresponding author**)
- 9 Velpandian M, Ragunathan A, Ummethala G, **Malladi SRK**, Meduri P. Low-Potential Overall Water Splitting Induced by Engineered CoTe₂-WTe₂ Heterointerfaces. *ACS Appl Energy Mater.* 2023 Jun 12;6(11):5968–78. IF 5.4 Q1
- 10 Kumar M, Meena B, Subramanyam P, Ummethala G, **Malladi SRK**, Dutta-Gupta S, et al. CuInS₂ Nanosheet Arrays with a MoS₂ Heterojunction as a Photocathode for PEC Water Splitting. *Energy and Fuels* 2023;37(3):2340–9. IF 5.5 Q1
- 11 Bhat AP, Joshi MC, Harshvardaan M, Ummethala G, Sakthikumaran P, Kibkalo L, Tavabi AH, **Malladi SRK** et al. Ba_{0.85}Ca_{0.15}Zr_{0.1}Ti_{0.9}O₃/CoFe₂O₄/Ba_{0.85}Ca_{0.15}Zr_{0.1}Ti_{0.9}O₃Nanoscale Composite Films with 2-2 Connectivity for Magnetoelectric Actuation. *ACS Appl Nano Mater.* 2022;5(12):17652–63. IF 5.4 Q1
- 12 Janakiram S, Phani PS, Ummethala G, Jagdeesh H V, **Malladi SK**, Gautam J, et al. Insights on early recovery kinetics in ferrite - pearlite cold rolled high strength sheet steels. *Mater Charact.* 2022;193. IF 5.1 Q1
- 13 Jana S, Panigrahi G, Ummethala G, Ghosh A, **Malladi SK**, Niranjana MK, et al. Extremely low thermal conductivity in BaSb₂Se₄: Synthesis, characterization, and DFT studies. *J Solid State Chem.* 2022;315. IF 3.3 Q2
- 14 Velpandian M, Ummethala G, **Malladi SK**, Meduri P. Heterostructures of tin and tungsten selenides for robust overall water splitting. *J Colloid Interface Sci.* 2022;623:561–73. IF 9.4
- 15 Bandaru P, Ummethala G, **Malladi SRK**, Dutta-Gupta S. Microstructure Dictates the Behavior of Plasmons in Nanostructured Ag-Cu Alloy Films. *Journal of Physical Chemistry C* 2022;126(37):15915–23. IF 3.3 Q2
- 16 Panigrahi G, Jana S, Ishtiyak M, Tripathy B, **Malladi SK**, Niranjana MK, et al. Chalcogen dependent metal vacancies and disorder in Ba₂Ln_{1-x}Mn_{2-y}S₅ and Ba₂-δLn_{1-x}Mn_{2-y}Se₅ (Ln = Pr, Nd, and Gd) structures. *J Alloys Compd.* 2022;901. IF 5.8 Q1
- 17 Bhargavi K, Ray D, Chawdhury P, **Malladi S**, Shashidhar T, Subrahmanyam C. Oxidation of Toluene by Ozone over Surface-Modified γ-Al₂O₃: Effect of Ag Addition. *Catalysts.* 2022;12(4). IF 3.3 Q2

- 18 Jana S, Panigrahi G, Tripathy B, **Malladi SK**, Niranjana MK, Prakash J. A new non-stoichiometric quaternary sulfide Ba₃.14(4)Sn₀.61(1)Bi₂.39(1)S₈: Synthesis, crystal structure, physical properties, and electronic structure. *J Solid State Chem.* 2022;308. **IF 3.3 Q2**
- 19 Jana S, Ishtiyak M, Govindaraj L, Arumugam S, Tripathy B, **Malladi SK**, et al. Metal to insulator transition in Ba₂Ge₂Te₅: Synthesis, crystal structure, resistivity, thermal conductivity, and electronic structure. *Mater Res Bull.* 2022;147. **IF 5.6 Q1**
- 20 Tripathy B, **Malladi SRK**, Bhattacharjee PP. Development of ultrafine grained cobalt-free AlCrFe₂Ni₂ high entropy alloy with superior mechanical properties by thermo-mechanical processing. *Materials Science and Engineering A.* 2022;831. **IF 6.4 Q1**
- 21 Kumar VK, Ghosh S, Naresh V, Ummethala G, **Malladi SRK**, Martha SK. Binder and conductive diluents free NaVPO₄F based free-standing positive electrodes for sodium-ion batteries. *J Electrochem Soc.* 2022;169(1). **IF 2.8 Q2**
- 22 Velpandian M, Ummethala G, **Malladi SK**, Meduri P. Heterogeneous interface-induced electrocatalytic efficiency boosting of bimetallic Cu/Zn selenides for stable water oxidation and oxygen reduction reactions. *Catal Sci Technol.* 2022;12(17):5302–14. **IF 4.4 Q1**
- 23 Yadav S, Jana S, Panigrahi G, **Malladi SK**, Niranjana MK, Prakash J. Five coordinated Mn in Ba₄Mn₂Si₂Te₉: synthesis, crystal structure, physical properties, and electronic structure. *Dalton Transactions.* 2022;51(24):9265–77. **IF 3.5 Q2**
- 24 Ghosh S, Tippireddy S, Shankar G, Karati A, Rogl G, Rogl P, Bauer E, **Malladi SRK**, et al. InSb nanoparticles dispersion in Yb-filled Co₄Sb₁₂ improves the thermoelectric performance. *J Alloys Compd.* 2021;880. **IF 5.8 Q1**
- 25 Saha J, Saha R, **Malladi SRK**, Bhattacharjee PP. Microstructure and texture of CoCrNi medium entropy alloy (MEA) processed by severe cryo-rolling: A study vis-a-vis cold-rolling. *Intermetallics.* 2021;138. **IF 4.6 Q1**
- 26 Janakiram S, Phani PS, Ummethala G, **Malladi SK**, Gautam J, Kestens LAI. New insights on recovery and early recrystallization of ferrite-pearlite banded cold rolled high strength steels by high speed nanoindentation mapping. *Scr Mater.* 2021;194. **IF 5.7 Q1**
- 27 Saha J, Ummethala G, **Malladi SRK**, Bhattacharjee PP. Severe warm-rolling mediated microstructure and texture of equiatomic CoCrFeMnNi high entropy alloy: A comparison with cold-rolling. *Intermetallics.* 2021;129. **IF 4.6 Q1**
- 28 Ishtiyak M, Jana S, Karthikeyan R, Ramesh M, Tripathy B, **Malladi SK**, et al. Syntheses of five new layered quaternary chalcogenides SrScCuSe₃, SrScCuTe₃, BaScCuSe₃, BaScCuTe₃, and BaScAgTe₃: Crystal structures, thermoelectric properties, and electronic structures. *Inorg Chem Front.* 2021;8(17):4086–101. **IF 5.9 Q1**
- 29 Kumar SK, Ghosh S, **Malladi SK**, Nanda J, Martha SK. Nanostructured Silicon-Carbon 3D Electrode Architectures for High-Performance Lithium-Ion Batteries. *ACS Omega.* 2018;3(8):9598–606. **IF 3.7 Q2**
- 30 Basak S, Ganapathy S, **Malladi SK**, Vicarelli L, Schreuders H, Dam B, et al. Designing Reliable Operando TEM Experiments to Study (De)lithiation Mechanism of Battery Electrodes. *J Electrochem Soc.* 2019;166(14):A3384–6. **IF 2.8 Q2**
- 31 Vicarelli L, Migunov V, **Malladi SK**, Zandbergen HW, Dunin-Borkowski RE. Single Electron Precision in the Measurement of Charge Distributions on Electrically Biased Graphene Nanotips Using Electron Holography. *Nano Lett.* 2019;19(6):4091–6. **IF 9.6 Q1**
- 32 Kabiri Y, Ananth AN, van der Torre J, Katan A, Hong JY, **Malladi S**, et al. Distortion of DNA Origami on Graphene Imaged with Advanced TEM Techniques. *Small.* 2017;13(31). **IF 13.1 Q1**
- 33 Liu C, **Malladi SK**, Xu Q, Chen J, Tichelaar FD, Zhuge X, et al. In-situ STEM imaging of growth and phase change of individual CuAl_x precipitates in Al alloy. *Sci Rep.* 2017;7(1). **IF 3.8 Q2** (*equal contribution along with first author)

Section A: List of publications before joining IITH.

- 34 Hellmann R, Cotte S, Cadel E, **Malladi S**, Karlsson LS, Lozano-Perez S, et al. Nanometre-scale evidence for interfacial dissolution-precipitation control of silicate glass corrosion. *Nat Mater.* 2015;14(3):307–11. **IF 37.2 Q1**
- 35 Du S, Lin K, **Malladi SK**, Lu Y, Sun S, Xu Q, et al. Plasma nitriding induced growth of Pt-nanowire arrays as high performance electrocatalysts for fuel cells. *Sci Rep.* 2014;4. **IF 3.8 Q2**
- 36 **Malladi SK**, Xu Q, Van Huis MA, Tichelaar FD, Batenburg KJ, Yücelen E, et al. Real-time atomic scale imaging of nanostructural evolution in aluminum alloys. *Nano Lett.* 2014;14(1):384–9. **IF 9.6 Q1** (also corresponding author)
- 37 Du S, Lu Y, **Malladi SK**, Xu Q, Steinberger-Wilckens R. A simple approach for PtNi-MWCNT hybrid nanostructures as high performance electrocatalysts for the oxygen reduction reaction. *J Mater Chem A Mater.* 2014;2(3):692–8. **IF 10.4 Q1**

- 38 Schneider GF, Xu Q, Hage S, Luik S, Spoor JNH, **Malladi S**, et al. Tailoring the hydrophobicity of graphene for its use as nanopores for DNA translocation. *Nat Commun.* 2013;4. **IF 14.7 Q1**
- 39 **Malladi SRK**, Xu Q, Tichelaar FD, Zandbergen HW, Hannour F, Mol JMC, et al. Early stages during localized corrosion of AA2024 TEM specimens in chloride environment. *Surface and Interface Analysis.* 2013;45(10):1619–25. **IF 1.75 Q3 (also corresponding author)**
- 40 Rudneva M, Van Veldhoven E, **Malladi SK**, Maas D, Zandbergen HW. Novel nanosample preparation with a helium ion microscope. *J Mater Res.* 2013;28(8):1013–20. **IF 2.7 Q2**
- 41 **Malladi SRK**, Tichelaar FD, Xu Q, Wu MY, Terryn H, Mol JMC, et al. Quasi in situ analytical TEM to investigate electrochemically induced microstructural changes in alloys: AA2024-T3 as an example. *Corros Sci.* 2013;69:221–5. **IF 7.6 Q1 (also corresponding author)**
- 42 Xu Q, Wu MY, Schneider GF, Houben L, **Malladi SK**, Dekker C, et al. Controllable atomic scale patterning of freestanding monolayer graphene at elevated temperature. *ACS Nano.* 2013;7(2):1566–72. **IF 15.4 Q1**
- 43 **Malladi S**, Shen C, Xu Q, de Kruijff T, Yücelen E, Tichelaar F, et al. Localised corrosion in aluminium alloy 2024-T3 using in situ TEM. *Chemical Communications.* 2013;49(92):10859–61. **IF 4.3 Q1 (also corresponding author)**
- 44 Agarwal M, Kumar V, **Malladi SRK**, Balasubramaniam R, Balani K. Effect of current density on the pulsed co-electrodeposition of nanocrystalline nickel-copper alloys. *JOM.* 2010;62(6):88–92. **IF 2.1 Q2**

ONE BOOK CHAPTER:

1. A. K. Erdamar, S. **Malladi**, F. D. Tichelaar, and H. W. Zandbergen, 'Closed Cell Systems for in Situ Tem with Gas Environments Ranging from 0.1 to 5 Bar', in *Controlled Atmosphere Transmission Electron Microscopy*, ed. by Thomas Willum Hansen and Jakob Birkedal WagnerSpringer International Publishing, 2016), pp. 165-210.

FOURTEEN PUBLISHED CONFERENCE PROCEEDINGS:

1. Govind Ummethala, Amir H. Tavabi, Sairam K. Malladi, and Rafal E. Dunin-Borkowski, "On the Origins of Supercapacitance in Graphene Liquid Cells using off-axis Electron Holography", (Poster P-008), The 12th Asia Pacific Microscopy Congress (APMC-2020) and 40th Annual Meeting of Electron Microscope Society of India (EMSI) 2020, Hyderabad, India, 3-7 February 2020
2. Govind Ummethala, Ravi Jada, Sairam Malladi, Rajadurai Chandrasekar, "Growth of Chiral Organic Microparticles for Photonic Applications using Graphene Liquid Cells", (Poster P-009), The 12th Asia Pacific Microscopy Congress (APMC-2020) and 40th Annual Meeting of Electron Microscope Society of India (EMSI) 2020, Hyderabad, India, 3-7 February 2020
3. Kabiri, Yoones, Adithya Ananth, Jaco van der Torre, Allard Katan, **Sairam Malladi**, Jin-Yong Hong, Jing Kong, Henny Zandbergen, and Cees Dekker. "Transmission electron microscopy of unstained DNA origami structures on free-standing graphene." In European Microscopy Congress 2016: Proceedings, pp. 53-54. Weinheim, Germany: Wiley-VCH Verlag GmbH & Co. KGaA, 2016.
4. **Malladi, S. R. K.**, Erdamer, A. K., de Kruijff, T., Liu, C., Tichelaar, F., & Zandbergen, H. (2016, November). Improved gas holder for in-situ TEM studies. In European Microscopy Congress 2016: Proceedings (pp. 153-154). Weinheim, Germany: Wiley-VCH Verlag GmbH & Co. KGaA.
5. **Sairam K Malladi**, Ahmet Erdamar, Tom de Kruijff, Chunhui Liu, Frans Tichelaar, Henny Zandbergen, "Studies on in situ heat-treatment and corrosion of Al alloy 2024 in a TEM", in: MRS Spring Meeting 2015, San Francisco, CA, USA, from 6th to 10th April 2015 (Oral Presentation)
6. **Sairam Malladi**, Shibabrata Basak, Meng-Yue Wu, Qiang Xu, Ahmet Erdamar, Frans Tichelaar, Henny Zandbergen. "In situ environmental TEM studies using MEMS based devices", in: 18th International Microscopy Congress (IMC18), Prague, Czech Republic, from 7th to 12th September 2014 (Oral Presentation)
7. S Basak, **SK Malladi**, S Ganapathy, M Wagemaker, FD Tichelaar, HW Zandbergen. "In situ TEM investigation of the electrochemical (de) lithiation of single grain LiFePO₄", in: 18th International Microscopy Congress (IMC18), Prague, Czech Republic, from 7th to 12th September 2014 (Oral Presentation)
8. **Sairam K Malladi**, Qiang Xu, Marijn A van Huis, Frans D Tichelaar, Joost Batenburg, Emrah Yücelen, Beata Dubiel, Aleksandra Czyska-Filemonowicz, Henny W Zandbergen. "Nanostructural evolution in aluminium alloys by in situ (S)TEM heat-treatment

studies”, in: 14th International Conference on Aluminium Alloys, Trondheim, Norway, from 15th to 19th June 2014 (Oral Presentation)

9. **S. R. K. Malladi**, Q. Xu, C. Shen, G. Pandraud, F. D. Tichelaar, H. W. Zandbergen. Studies on localized corrosion in aluminium alloys using in situ transmission electron microscopy, in: Proceedings of the 15th European Microscopy Congress, EMC 2012, Manchester, United Kingdom, from 16th – 21st September 2012, (Oral Presentation)
10. **S. R. K. Malladi**, Q. Xu, G. Pandraud, F. D. Tichelaar, H. W. Zandbergen, K. Kulawik, B. Dubiel, A. Czyrska-Filemonowicz. Phase transformations in Al alloys during heat treatment investigated by in situ TEM, in: Proceedings of the 15th European Microscopy Congress, EMC 2012, Manchester, United Kingdom, from 16th – 21st September 2012, poster # 314, in session PS2.7, (Poster).
11. **S. R. K. Malladi**, Q. Xu, F. D. Tichelaar, H. W. Zandbergen, F. Hannour, J. M. C. Mol, H. Terryn. Ex situ TEM corrosion studies on aluminium alloy 2024-T3 in chloride environment, in: Proceedings of the VIth Aluminium Surface Science & Technology, ASST 2012, Sorrento, Italy, from 27th – 31st May 2012, abstract in pg. 91, article #25 in published proceedings (Oral Presentation).
12. Maria Rudneva, Emile van Veldhoven, **Sairam K Malladi**, and Henny W Zandbergen. "Application of Helium Ion Microscope for Sample Modification at Nanoscale." *Microscopy and Microanalysis* 19, no. S2 (2013): 856-57.
13. Maria Rudneva, Emile van Veldhoven, **Sairam Malladi**, Diederik Maas, and Henny W Zandbergen. "Application of the Helium Ion Microscope as a Sculpting Tool for Nanosamples." *MRS Proceedings* 1455 (2012): mrss12-1455-ii10-01.
14. **S. R. K. Malladi**, F. D. Tichelaar, H. W. Zandbergen. Quasi In-situ Oxidation Studies on Aluminum Alloy 2024-T3, 17th International Microscopy Congress (IMC17), Rio de Janeiro, Brazil, from 19 to 24 September 2010 (Poster).

INVITED TALKS:

1. "Challenges and opportunities with liquid cell in-situ electron microscopy", Sairam K Malladi, The 12th Asia Pacific Microscopy Congress (APMC-2020) and 40th Annual Meeting of Electron Microscope Society of India (EMSI) 2020, Hyderabad, India, 3-7 February 2020. *Invited Talk*
2. "Challenges with liquid cell in-situ electron microscopy", Sairam K Malladi, Invited lecture at the Ernst Ruska Centre for Microscopy and Spectroscopy with Electrons, Forschungszentrum Juelich, December 2019.
3. "Recent trends in MEMS based in-situ TEM studies", Sairam K Malladi, Invited lecture at the Japan Fine Ceramics Centre, Nagoya, Japan, 7 December 2018.
4. "TEM as a nanoscale laboratory: in-situ TEM studies based on MEMS devices", Sairam K. Malladi, International Conference on Recent Trends in Materials Science and Technology (ICMST 2018), Thiruvananthapuram, India, 10-13 October, 2018. *Invited Talk*
5. "TEM as a laboratory: Carrying in-situ TEM studies using MEMS based devices", Sairam K Malladi, National Conference on Emerging Trends in Science, Technology & Application of Electron Microscopy (STAEM 2018), Thiruvananthapuram, India, 19-21 December 2018. *Invited Talk*
6. "Challenges with in-situ microscopy: heating, gases and liquids", Electron Microscope Society of India Meeting 2018, Bhubaneswar, India, July 2018 *Invited Talk*
7. "TEM as a micro-laboratory: in situ Transmission Electron Microscopy using MEMS based devices", Sairam K Malladi, Kyoto University, Japan, 5th March 2018. *Invited talk*
8. Sairam K Malladi, In-situ TEM for Energy Materials: Technique development and Applications, The 4th workshop on Environment and Energy, Osaka University, Japan, 3rd March 2018.
9. "In-situ TEM studies: Heat-treatment and Corrosion of Aluminium Alloys", Midwest Microscopy and Microanalysis Society meeting (M3S) on In situ Microscopy Of Materials, on 6th June 2014 at University of Wisconsin Madison, USA. *Invited talk*
10. "In-situ TEM studies: Heat-treatment and Corrosion of Aluminium Alloys". Workshop at Nanoday 2014, on 13th June 2014 at University of Maryland, Baltimore, USA. *Invited talk*
11. "In-situ TEM studies in Aluminium Alloys: Heat-treatment and Corrosion", International Conference on Electron Microscopy & XXXV Annual Meeting of the Electron Microscope Society of India (EMSI), on 11th of July 2014 at New Delhi, India. *Invited talk*
12. "The role of prototypes in scientific research", CRISP platform DRS-6 on 17th April 2014 at Delft. *Key note lecture*
13. "In-situ heating experiments on TITAN³", 4th Stanislaw Gorczyca European School on TEM Basics and Advanced Sample Preparation, 1 – 4 October 2013 at Krakow, Poland. *Lecture & demonstration*

PROJECTS (SPONSORED/CONSULTANCY) IN THE FOLLOWING FORMAT HANDLED AT IITH:

Sl. No.	As PI or Co-PI	Project Title	Sponsoring Agency	Period of project	Project Cost (in Rs. Lakhs)
1	PI	High-tilt specimen holders for 3d-Transmission Electron Microscopy	IIT Hyderabad	2018-2021 (completed)	3
2	PI	New insights into the localised corrosion of advanced metallic alloys using electron microscopy	SERB-ECR	Sep 2018 – Sep 2021 (completed)	52.47
3	Co-PI	Tuning heterogeneous nanostructure via strain-partition engineering for developing cobalt-free cost-effective eutectic high entropy alloys with outstanding strength-ductility synergy (PI – Prof. Pinaki Bhattacharjee, IITH)	DST	2020-2023 (completed)	25.80
4	PI	Investigating the evolution of heterogeneous microstructure in metallic alloys by thermomechanical processing using correlative FIB-SEM and in-situ TEM techniques	DRDO	Dec 2021 – Present	98.14
5	Co-PI	Correlative microscopy of substructure during processing of High Strength Steels (PI, Prof. Jaiprakash Gautam, UoH)	UoH-IoE grant	Dec 2021 – Mar 2024 (completed)	50
6	Co-PI	In-Situ Nano-Transformable Hydrogel for Affordable Targeted Therapy of Highly Metastatic Cancers (PI Dr. Aravind Rengan, IITH)	IIT Hyderabad	Jul 2022 – Present	100
7	Co-PI	Development of 3D-bioprinted artificial pancreas with nanosensors for real-time monitored insulin release: In vitro model replacing animal models for diabetic treatment (PI Dr. Subha Narayan Rath, IITH)	IIT Hyderabad	Jul 2022 – Present	98.14
8	PI	Tailoring microstructure and magnetic properties of high entropy alloys by advanced microscopy studies	SPARC	Nov 2023 – Present	25
9	Co-PI	Microprocessing of Organic Crystals using a Focused-Ion Beam (FIB) Lithography for Industrial Scale Production of Photonic Integrated Circuit (PI, Prof. R. Chandrasekar, UoH)	MoE-STARS	May 2024 – Present	60
10	Co-PI	Self-healing Non-linear Optical Crystals as New Materials for All-	DST-RSF	Sep 2024 – Present	85.44

		Organic Photonic Integrated Circuits (PI, Prof. R. Chandrasekar, UoH)			
11	Co-PI	Electron beam powder-bed fusion of nickel-based super alloys CM247LC and BZL12Y	DRDO	Sanctioned	1829.962
11	PI	Development Of Transmission Electron Microscopy Holder and Laser Integrated Electron Microscopy Platforms For In-Situ Experiments	DST-AMT	Awaiting fund release	109.5
12	PI	Study of microstructural evolution of high-strength steels and super alloys for defence applications at multiple length scales in real-time	DRDO	Awaiting fund release	250.52
Funding secured as PI (lakhs INR)					538.63
Funding secured as co-PI (lakhs INR)					2249.342
Total Funding (lakhs INR)					2787.972

Funding for setting up national facility: **INR 8000 Lakhs**

Sl. No.	As PI or Co-PI	Project Title	Sponsoring Agency	Period of project	Project Cost (in Rs. Lakhs)
1	PI	Centre for In-situ and Correlative Electron Microscopy (SATHI-CISCoM) – consortium of 18 partners, including academic institutes, research labs and private industries	DST-SATHI	Mar 2024 – Present	8000

Funding for organising Symposia: **INR 17 Lakhs**

Sl. No.	As PI or Co-PI	Project Title	Sponsoring Agency	Period of project	Project Cost (in Rs. Lakhs)
1	PI	12th Asia-Pacific Microscopy Conference (APMC-2020)	DST	Jan 2020	4
2	PI	12th Asia-Pacific Microscopy Conference (APMC-2020)	CSIR	Jan 2020	5
3	PI	12th Asia-Pacific Microscopy Conference (APMC-2020)	BRNS	Jan 2020	8