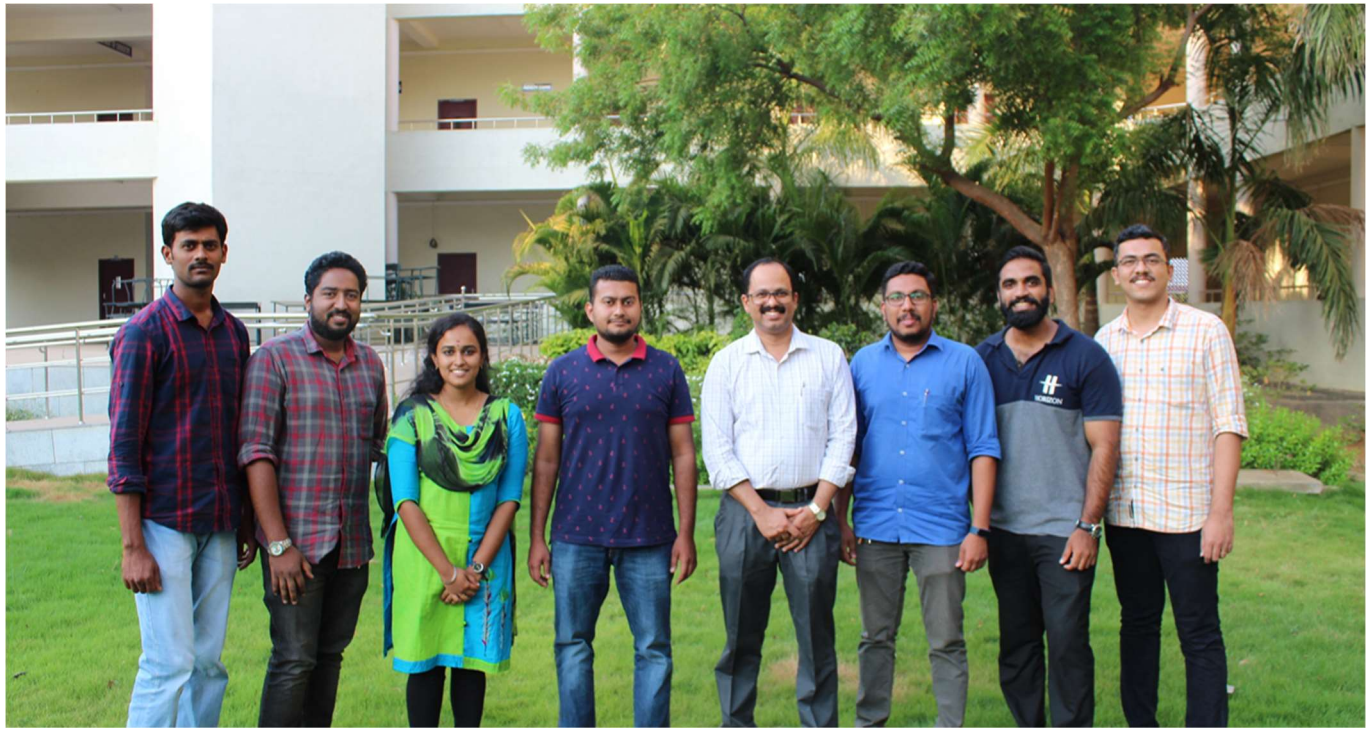
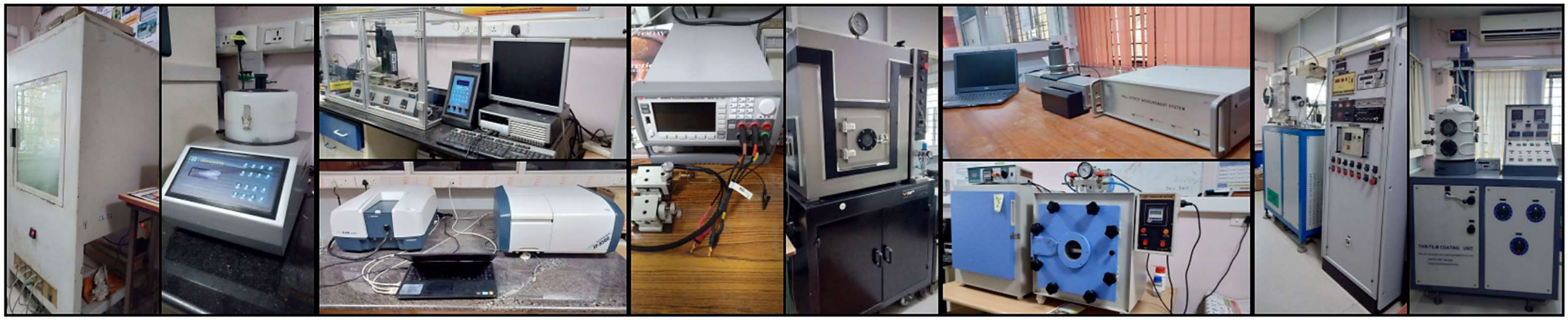
Optoelectronic Materials and Devices Lab (OMDL)

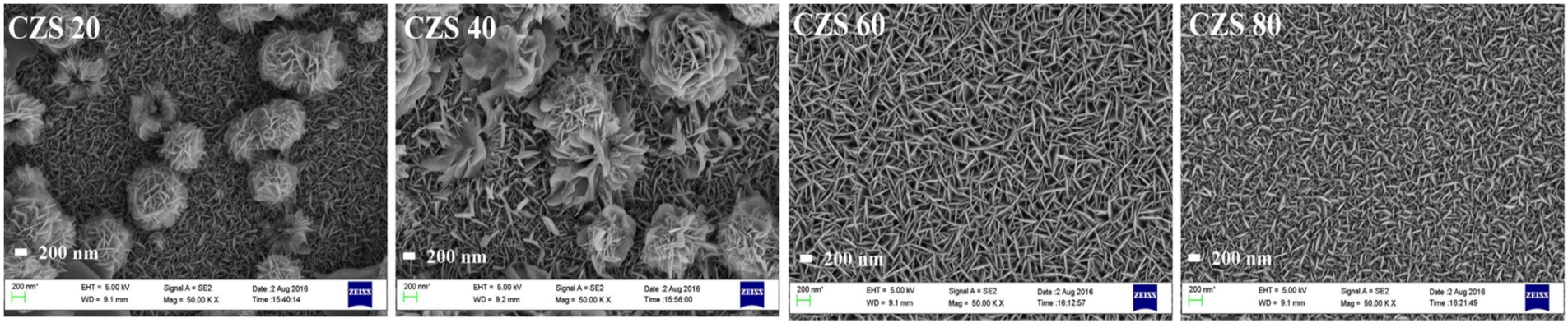


The research team at OMDL under the leadership of Dr. M.C. Santhosh Kumar has more than a decade of experience in the field of thin film deposition and device fabrication. The team focuses on various physical and chemical deposition techniques for fabricating novel thin film based optoelectronic devices. Deposition technique includes RF Magnetron Sputtering, Thermal Evaporation, Vacuum Spray Pyrolysis, SILAR, Spin Coating and Chemical Bath Deposition. The lab is equipped with optical and electrical characterization facilities such as Uv-VIS-NIR Spectrophotometer, Spectroflourometer, Hall Effect Measurement system and Source Measure Unit.



Thin Film Photovoltaics

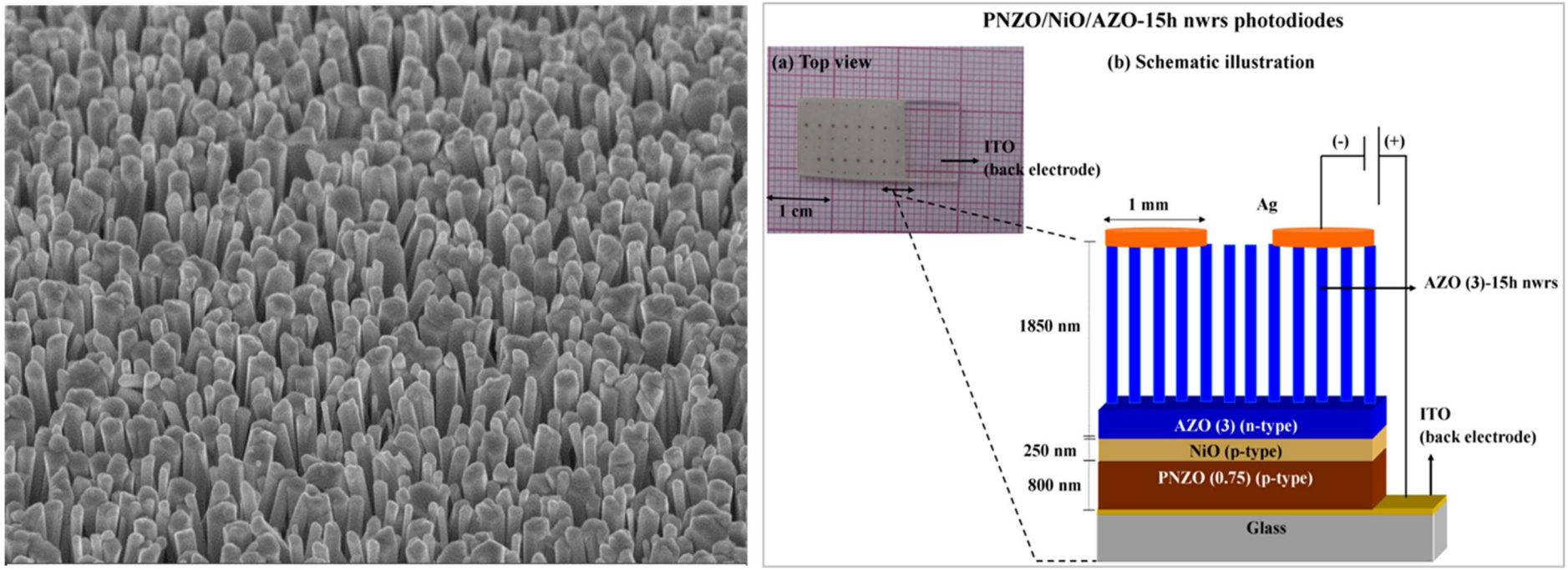
Main focus is to develop low cost and eco-friendly compounds for future energy applications. This includes deposition of various metal-sulfide thin films, characterization and fabrication. The current research work involves the fabrication of Cd free solar cells based on ternary materials like CuZnS, CuSnS, CuSbS and quarternary material like CuZnSnS.



Morphology of CuZnS thin films with various Cu and Zn ratios

Optoelectronic Devices

Metal oxide thin films are deposited for applications in sensors, photodetectors, LEDs etc. Metal oxide like ZnO has been investigated for various applications.



(a) Vertically aligned ZnO nanowires by aqueous chemical growth and (b) fabricated photodiode

Research Group

	**Edwin Jose** (Part Time) Assistant Professor, Christ College Irinjalakuda Area of interest: Inorganic thin film solar cells e-mail: *edwinthalore@gmail.com*
	**Sai Guru Srinivasan S** Area of interest: Thin films for photocatalysis and H production e-mail: *saigurusrinivasan@gmail.com*
	**Ramaswamy Pandian** (Part Time) Scientist, NPOL Kochi Area of interest: Embedded systems for naval applications e-mail: *pandiansr67@gmail.com*
	**B. Hemanth Kumar** Area of interest: Photodetectors and thin film solar cells e-mail: *hemanthbangolla@gmail.com*

	**Devika Mahesh** Area of interest: Nanostructured oxide thin films for LED applications e-mail: *devikamahesh72@gmail.com*
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	**John Paul** Area of interest: Titania based photoanodes for DSSC applications e-mail: *johnpky@gmail.com*
	**Girish N. Namboothiri** (Part Time) Scientist, VSSC Thiruvananthapuram Area of interest: Neutron Radiography e-mail: *girish.nampoothiri@gmail.com*
	**Neju Mathew Philip** Area of interest: TMDC thin films for energy applications e-mail: *nejumathew@gmail.com*

Alumni

	**Dr. T. Prasad Rao** Post Doctoral Researcher, Wayne State University USA Thesis: *Preparation and Characterization of n-type and p-type ZnO Thin Films for Optoelectronic Applications* (2011)
	**Dr. Swapna Ramella** Associate Professor, Avanthi Institute of Engineering & Technology Vizag Thesis: *Investigations on preparation and properties of various n-type and p-type ZnO thin films and fabrication of p-n homojunctions* (2014)
	**Dr. R. Amiruddin** Assistant Professor, Crescent University Chennai Thesis: *Aqueous chemical growth of ZnO nanowires and fabrication of high speed ultraviolet photodiodes* (2017)
	**Dr. T. Srinivasa Reddy** Assistant Professor, PBS College of Arts and Science Vijayawada Thesis: *Deposition and characterization of tin sulfide and copper tin sulfide thin films-prospective absorber layers for solar cells* (2018)
	**Dr. Saheer Cheemadan** Assistant Professor, MAMO College Manassery, Calicut, Kerala Thesis: *Deposition and Characterization of NiO thin films by RF magnetron sputtering and fabrication of p-NiO/p-CuO/n-CdO: ZnO heterojunctions* (2019)