

Dr. SRIDHARAN BALU

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Profile

Dr. Sridharan Balu is a postdoctoral researcher at the National Taipei University of Technology (NTUT), Taipei, Taiwan, with a strong focus on advanced materials and sustainable technologies. His current research areas include photoelectrochemical water splitting, CO₂ hydrogenation reactions, and EMI shielding materials and films. With over 30 publications including research and review articles in prestigious international SCI journals, Dr. Sridharan has demonstrated excellence in scientific research and innovation. Additionally, he has served as a potential reviewer for over 70 international SCI journals (Wiley, Elsevier, Springer Nature, RSC, ACS), reflecting his expertise and commitment to the advancement of his field.

Work Experience

- **Postdoctoral Researcher** July 2021 – present
Dept. of Chemical Engineering and Biotechnology | NTUT, Taipei, Taiwan

Education

- **Doctor of Philosophy** in Energy and Optoelectronic Materials Sep 2017 – Jul 2021
National Taipei University of Technology, Taipei, Taiwan
- **Master of Science** in Chemistry Jul 2015 – Jun 2017
Madurai Kamaraj University, Madurai, India
- **Bachelor of Science** in Chemistry Jul 2012 – Jun 2015
Madurai Kamaraj University, Madurai, India

Research experience and Projects

- ☑ **Research areas:** 2D Materials | Semiconductor Materials | CO₂ Hydrogenation | Water-Splitting | EMI-Shielding Materials | Photo(electro)catalysis | Wastewater Treatment.
- **National Taipei University of Technology, Taipei, Taiwan**
Postdoctoral Researcher (July 2021 – Present) | **PI:** Prof. Dr. Thomas Chung -Kuang Yang
- ☑ **Current Projects:**
 - Bandgap Tailoring & Defect Engineering Strategies for Novel Semiconductor-MXenes Hybrids in Photoelectrochemical Hydrogen Evolution Reaction (NSTC-Taiwan).
 - Multiscale computer modelling, synthesis and rational design of photo(electro)catalysts for efficient visible-light-driven seawater splitting-CatWatSplit (M-ERA.NET).
 - MXenes (2D)-mediated photo(electro)catalysts for CO₂ valorization to C1, C2 products: AI/DFT modeling, synthesis, and application (M-ERA.NET).
 - Development of next-generation high-performance electromagnetic shielding soft PI materials (AEM-Taiwan).
- **National Taipei University of Technology, Taipei, Taiwan**
Ph.D. (Sep 2017-July 2021) | **Supervisor:** Prof. Dr. Thomas Chung-Kuang Yang
Thesis title: Rational Synthesis and Development of Visible-Light-Driven g-C₃N₄-based Photocatalytic Nanocomposites for Environmental Remediation & Energy Production.

- **SASTRA Deemed University, Thanjavur, India**

M.Sc. Research Project (May 2016 – Jun 2017) | **Supervisor:** Dr. Selvaganesan Subramaniapillai

Thesis title: Design, synthesis and applications of magnetically separable ionic liquids.

Technical Skills

- **Analytical and Characterization Instruments:** Proficient in the operation and analysis of advanced analytical and characterization instruments, including: XPS, TEM, FE-SEM, Raman, XRD, BET, UV-Vis, FT-IR, DRIFTS, Autolab and CH instruments.
- **Nanomaterials Synthesis:** Knowledgeable in nanomaterial synthesis techniques, including hydrothermal, solvothermal, and sol-gel methods.
- **Thin-Film and Photoelectrode Fabrication:** Skilled in thin-film coating techniques such as spin coating, dip coating and photoelectrode fabrication.
- **Reactor Design:** Experienced in designing and assembling reactors for catalytic and photoelectrochemical applications.

Conferences

- Taiwan International Conference on Catalysis, TICC 2024, 19-21 Jun 2024, NTUST, Taipei, Taiwan.
- 5th International Conference on Sustainable Technologies for Water and Wastewater Treatment, Technoscape 2023, 14-16 Dec 2023, Vellore Institute of Technology, Vellore, India.
- International Conference on Future Healthcare and Economic Development, Sep 2021, NCKU, Tainan, Taiwan.
- Online Joint Symposium “Engineer A Better Tomorrow”, Nov 2020, NTUT, Taipei, Taiwan.
- International Workshop in Technology and Sustainable Development, Jul 2019, NTUT, Taipei, Taiwan.
- Taiwan Solid State Lighting Conference, May 2019, Taipei, Taiwan.
- International Symposium on “New Horizon in Advanced Materials” Kick off Symposium of Academic Exchange Program for TAIPEI TECH-IMRAM, Dec 2018, NTUT, Taipei, Taiwan.
- Bilateral Symposium on Cutting-Edge Chemistry, Jan 2018, Hsinchu, Taiwan.

Honors & Awards

- CTCI - Science and Technology Outstanding Performance with the Scholarship Award for Excellence in Research (2021), Taiwan
- NSTC - National Science and Technology Council-Postdoctoral Researcher Academic Research Award (2023), Taiwan

Academic References

- **Prof. Dr. Thomas Chung-Kuang Yang,**
Vice President & Distinguished Professor,
Department of Chemical Engineering and Biotechnology,
National Taipei University of Technology, Taipei, Taiwan.

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- **Dr. Shih -Wen Chen,**
Assistant Professor,
Graduate Institute of Automation Technology,
National Taipei University of Technology, Taipei, Taiwan.

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Key Publications

- 1 **Balu, S.;** Venkatesvaran, H.; Lan, K. -W.; Yang, T. C. -K. Investigation of La-BiVO₄/g-C₃N₄ photocatalytic system for efficient removal of hazardous water contaminants. *Chemical Engineering Communications*, **2025**, 212 (1), 124-142. <https://doi.org/10.1080/00986445.2024.2372736>. [IF: 1.9]
- 2 **Balu, S.;** Chen, S.-W.; Piskunov, S.; Venkatesvaran, H.; Lee, L. W.-C.; Yang, T. C.-K. In-Co-Doped Bi_{1-x}VO₄ Drenched Sulfur-Doped g-C₃N₄ Nanocomposite: A Type-II Photo(Electro)Catalytic System for Visible-Light-Driven Water-Splitting and Toxic Removal Applications. *Advanced Composites and Hybrid Materials*, **2024**, 7 (1), 32. <https://doi.org/10.1007/s42114-024-00843-4>. [IF: 23.2]
- 3 **Balu, S.;** Hanan, A.; Venkatesvaran, V.; Chen, S. -W.; Yang, T. C. -K. Mohammad Khalid. Recent Progress in Surface-Defect Engineering Strategies for Electrocatalysts toward Electrochemical CO₂ Reduction: A Review. *Catalysts*, **2023**, 13 (2), 393. <https://doi.org/10.3390/catal13020393>. [IF: 3.8]
- 4 Yang, W.; Yasuda, S.; **Balu, S.;** Wang, Y.; Kondo, J. N.; Yang, T. C.-K.; Yokoi, T.; A mechanistic study on the CO₂ activation over Pd-containing MCM-22 zeolite based on DRIFT analysis: Impact of counter cations in the zeolite framework, *Chemical Engineering Journal*, **2023**, Volume 471. <https://doi.org/10.1016/j.cej.2023.144762>. [IF: 13.3]
- 5 **Balu, S.;** Chen, Y. -L.; Chen, S. -W.; Yang, T. C. -K. Rational synthesis of Bi_xFe_{1-x}VO₄ heterostructures impregnated sulfur-doped g-C₃N₄: A visible-light-driven type-II heterojunction photo(electro)catalyst for efficient photodegradation of roxarsone and photoelectrochemical OER reactions, *Applied Catalysis B: Environmental*, **2021**, 304, 120852. <https://doi.org/10.1016/j.apcatb.2021.120852>. [IF: 20.2]
- 6 Venkatesvaran, H.; **Balu, S.;** Tsai, B.; Yang, T. C.-K. Construction of Z-Scheme Heterojunction Based on BiOBr-Nanoflakes Embedded Sulfonic-Acid-Functionalized g-C₃N₄ for Enhanced Photocatalytic Removal of Hazardous Pollutants in Aqueous Media. *Journal Taiwan Institute of Chemical Engineers*, **2023**, 142, 104637. <https://doi.org/10.1016/j.jtice.2022.104637>. [IF: 5.5]
- 7 Venkatesvaran, H.; **Balu, S.;** Lan, K.-W.; Yang, T. C.-K. ZnO-NRs Embedded Guar-Gum Derived CS@HNTs: A Bifunctional Catalyst for Electrochemical Detection and Photocatalytic Applications. *Journal of Environmental Chemical Engineering*, **2024**, 12 (1), 111895. <https://doi.org/10.1016/j.jece.2024.111895>. [IF: 7.4]
- 8 Chowdhury, A.; **Balu, S.;** Yang, T. C.-K. construction of α -Fe₂O₃-NPs@AgVO₃-NRs Z-scheme heterojunction: An efficient photo(electro)catalyst for Cr(VI) reduction and oxygen evolution reactions under visible-light, *Journal of Environmental Chemical Engineering*, **2023**. Volume 11, Issue 3. <https://doi.org/10.1016/j.jece.2023.109769>. [IF: 7.4]