

**Synergising Environmental Science Research & Technology
for a Sustainable Tomorrow**



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Jen Hotel Penang,
Malaysia

Editors: Norhashimah Morad
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PREFACE

Some of the greatest moments in scientific history were documented not in the most popular of textbooks or the most renowned of journals, but within the conscience of explorers who dedicated their lives unravelling the mysteries of the universe. As the flame of curiosity descended through apprentices and students, their burning desire for knowledge soon gave rise to a culture of exploration that transcended generations.

With that, the road towards research and development on science and sustainability was mapped; it is now up to us to nurture this flame by taking steps to explore the horizon for the benefit of mankind. And it was with this spirit that the International Conference on Research and Technology or ICERT was founded, with the aim of bringing together a diverse set of minds that would contribute to the frontiers of research in sustainability and environmental technology. Naturally, this tradition evolved to encompass researchers from across the spectrum, coming under one roof to deliberate on these frontiers.

We are proud to host participants who profess a multitude of disciplines from both the arts and sciences. Our approach towards research at the division of Environmental Technology, School of Industrial Technology, Universiti Sains Malaysia, places emphasis on multi-disciplinary endeavours, with many of our researchers actively involved in fundamental, exploratory and community development programs with an emphasis on sustainable research development.

The following pages contain the compiled papers presented and discussed during the 5th International Conference on Environmental Research and Technology (ICERT) 2017 held from 23rd to 25th August 2017 at Penang, Malaysia. With the guiding principle being sustainability in research and development, it seems apt for this year's ICERT 2017 to be themed 'Synergizing Environmental Science Research & Technology for A Sustainable Tomorrow'. We would like to highlight that all of the papers published in this proceeding were peer-reviewed.

With that, it gives us great pleasure to unveil the proceedings of the 5th ICERT 2017, and to extend our earnest appreciation for your collective effort in making this proceeding a successful one. We would like to thank all the authors for contributing their work to this proceeding and reviewers for providing constructive feedback to the authors.

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