

## Research Group Profile

# Sustainable Energy & Reacting Flow (SERF)

The prime focus of HiREF Laboratory is the engineering applications of high-speed reacting flows in the presence of various physical phenomena such as combustion and heat transfer. This focus, in principle, has driven the group to engage in cutting-edge related research areas such as combustion turbulence modeling and experiments, pulse combustion, flameless combustion and development of Pulse Combustion Engines. HiREF team is currently working to develop accurate turbulence and thermochemical models for different combustion applications, to build state-of-the-art experimental platforms for supersonic shock wave investigations and to establish a knowledge base for multidisciplinary thermofluids research topics. The group is also active in conducting research in heat transfer enhancement, nanofluids, binary gas mixtures, macroscale and microscale fluid flow.

### NICHE AREAS

- Flameless combustion
- Future propulsion system
- Mesoscale combustion
- Carbon nanotube
- Gas Turbine And Combustion Technology

### SERVICES & FACILITIES

- Consultation on high speed reacting flows.
- Sustainable and green technologies.
- A wide range of state of the art energy related problems.
- Rental equipment such as Bomb Calorimeter, rotary evaporator, fume cabinet, gas analyzer and furnace
- Design and fabricating the micro gas turbine technology and gasification system

## MEET OUR TEAM

### RESEARCH GROUP LEADER

Prof. Dr. Mazlan Bin Abdul Wahid

### RESEARCH GROUP MEMBER

Assoc. Prof Dr. Aminuddin Bin Saat

### RESEARCH GROUP MEMBER

Dr. Natrah Binti Kamaruzaman

### RESEARCH GROUP MEMBER

Dr. Mohd Fairus Bin Mohd Yasin

### RESEARCH GROUP MEMBER

Dr. Norazila Binti Othman

### RESEARCH GROUP MEMBER

Dr. Mohsin Bin Mohd Sies

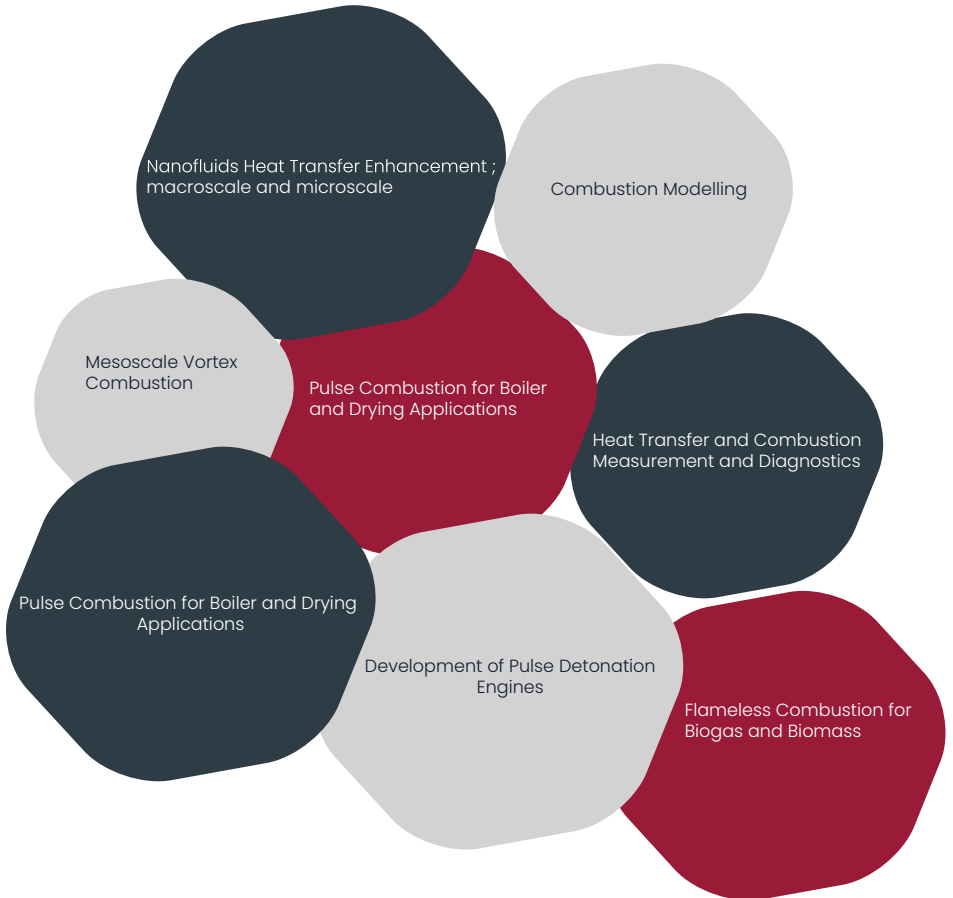
### RESEARCH GROUP MEMBER

Dr. Norikhwan Bin Hamzah

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## PROJECT HIGHLIGHTS



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## Sustainable Energy & Reacting Flow (SERF)

### ACTIVITIES

#### LIST OF RESEARCH GRANT

- Development of Novel Low NO<sub>x</sub> Flameless Combustion System Fueled by Biogas Produced from Palm Oil Mill Effluent, EScience Fund Scheme, Project funded by Ministry of Science and Technology Malaysia (MOSTI) June 2013 – May 2015.
- Development of Pulse Detonation Engine, Q.K130000.7139.00H97, Research University Grant (RUG) by Universiti Teknologi Malaysia. December 2012 – November 2014.
- Pulse Combustion Hot Water Boiler Prototype, Vote 78046, Prototype Research Grant Scheme (PRGS) funded by The Ministry of Higher Education. August 2012 – July 2014.
- Pulse Detonation Combustion for the Technological Development of Green Engine, Q.K130000.7139.00H97, Research University Grant (RUG) by Universiti Teknologi Malaysia. April 2011 – March 2013.
- Theoretical and Experimental Investigation on Hydrogen-Enriched Gaseous Diffusion Flames, Fundamental Research Grant Scheme (FRGS) funded by The Ministry of Higher Education. April 2010 – March 2012.
- Pulse Detonation for Propulsion Purposes, Vote 79299, EScience Fund Scheme, Project funded by Ministry of Science and Technology Malaysia (MOSTI). November 2008 – February 2011.
- Biofuel Pulse Combustion Characteristics, Vote 78046, Fundamental Research Grant Scheme (FRGS) funded by The Ministry of Higher Education. November 2006 – October 2008.
- Portable Biofuel Pulse Combustion Dryer, Vote 79111, EScience Fund Scheme, Project funded by Ministry of Science and Technology Malaysia (MOSTI). December 2006 – November 2008.
- Studies on the Effect of Swirl Intensities and Fuel Mixtures on Combustion and Flame
- Characteristics of Swirl Burner, Vote 75181. Project sponsored by Research Management Center of UTM. June 2004 – June 2006.
- Effect Of Energetic Particles On Graphite Nozzle Erosion In Hybrid Rocket Motor
- SURROGATE AND PRODUCT-EXPERIMENT OPTIMIZATION STUDY ON AIRCRAFT BIO-BASED FUEL TO PERFORM THE COMBUSTION CHARACTERISTICS IN A SINGLE GAS TURBINE COMBUSTOR
- Fixed Bed Gasifier
- Effect Of Plasma Gasification Process With Double Stages Steam And Air Oxidiser On The Production Of Hydrogen-rich Syngas Using Various Solid Waste As Feedstock
- Mathematical Modelling Based Optimization Of Alkyl Ester Biofuel Production From Waste Oil
- Feasibility Study Of Synthesis Gas Production From Agricultural Wastes
- Determination Of Relationship Between Performance Characteristics Of High Green Grade Hydrogen Peroxide And Thruster Engine Towards The Optimum Phase.
- Optimization On The Combustion Performance Of Firing Biodiesel From Waste Cooking Oil In An Oil Burner

#### OTHER RESEARCH ACTIVITIES

