



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA



# Translating Research For Global Growth : Foresighting UTM Roles and Experiences



**PROF. DR. NOR HANIZA SARMIN**

Associate Director  
Global Strategy & Engagement  
UTM International  
Universiti Teknologi Malaysia  
[nhs@utm.my](mailto:nhs@utm.my)



# Our Vision & Mission

## Vision

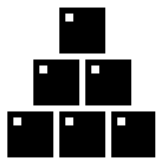
Seeks to actively participate in new adventures of ideas, experiment with innovative methods, and take intellectual initiatives to further discover and expand the frontier of knowledge

## Mission

To be an engine of growth of the nation where scholars and students exchange ideas as well as conduct research in a conducive environment that nurtures exploration and creativity to discover knowledge and create wealth, leading towards an improved quality of life

# Research Alliances

**Frontier  
Materials**



**Innovative  
Engineering**



**Resource  
Sustainability**



**Health &  
Wellness**



**Smart Digital  
Community**



<b>1500+</b>	Researchers
<b>170+</b>	Research Groups
<b>6</b>	Research Institutes
<b>7</b>	Centres of Excellence
<b>3</b>	Higher Institution CoE
<b>5</b>	Research Alliances

**601.9 mil**

Amount of research grant  
received (RM)

**524**

Patents filed (+ 352  
patents granted)

**562.2 mil**

Amount RU funding  
received (2011-2021)

**11,031**

Postgraduate enrolled  
(47% PhD, 28% foreign)\*

**32,617**

WoS indexed publication  
(29% high impact)

**68.0 mil**

Est. yearly economic  
spillover (based on 70% PG  
employment)<sup>†</sup>

**73%**

Principal investigators

**281.4 mil**

Research-based income  
(47% consultancy)\*\*

**191<sup>th</sup>**

2022 QS World Ranking  
(5th in Malaysia)

**Input**

**Output**

**Outcome**

# Signature Areas

1

Sustainable & Resilient Urbanisation



2

Next Generation Systems & Networks



3

Smart Manufacturing & Materials



4

Natural Product, Biorefinery & Biotechnology



5

Energy Security



6

Water Security



7

Smart Mobility



8

Biomedical & Healthcare Engineering



9

Smart Living & Sustainable Cities



# The World

---

Globalisation means that we are interconnected and interrelated more so than ever. More than a single country are facing the same issues and more importantly we are living in the same planet.

# Putting UTM in the World Map

## *International Alliances & Partnerships*

>30

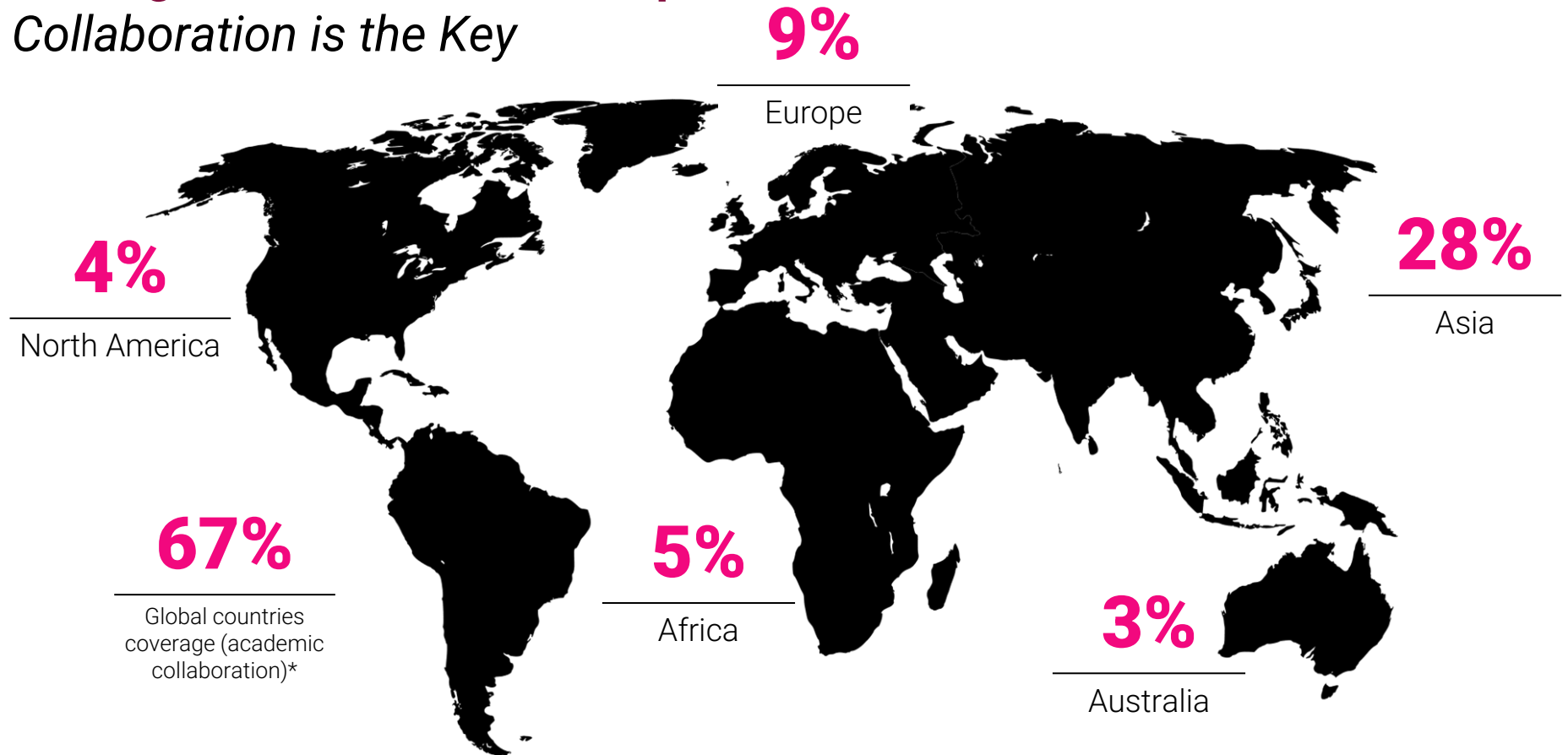
---

International  
Alliances

- ☐ Asia Technological University Network (ATU-Net)
- ☐ Asia-Oceania Five Universities Alliance
- ☐ ASEAN University Network / South East Asia Engineering Education Development Network (AUN/SEED-Net)
- ☐ EU-Malaysia Chamber of Commerce and Industry
- ☐ Global Technology Initiative (GTI) Consortium
- ☐ Indonesia-Malaysia Research Consortium (I'MRC)
- ☐ Japanese University Consortium (JUC)
- ☐ Presidents' Forum of Southeast and South Asia and Taiwan Universities (SATU Presidents' Forum)
- ☐ Promotion of Sustainability in Postgraduate Education and Research Network (ProSPER.Net)
- ☐ South East Asian Technical University Consortium (SEATUC)

# Putting UTM in the World Map

## *Collaboration is the Key*



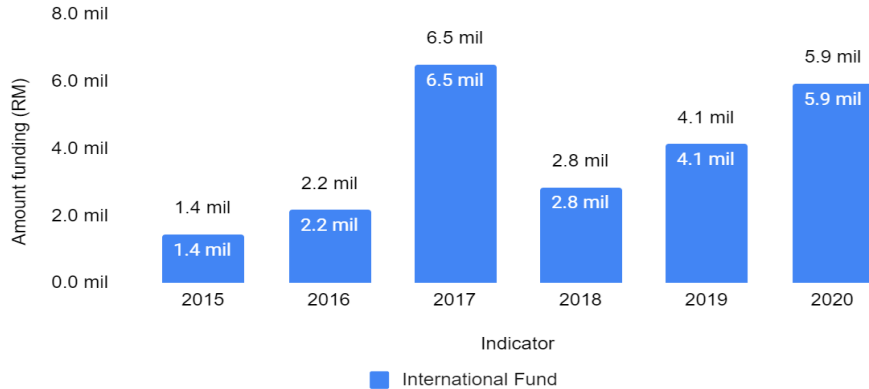


# Putting UTM in the World Map

## International Funded Research

### Research Funding Received (RM)

Yearly Performance



**+43%**

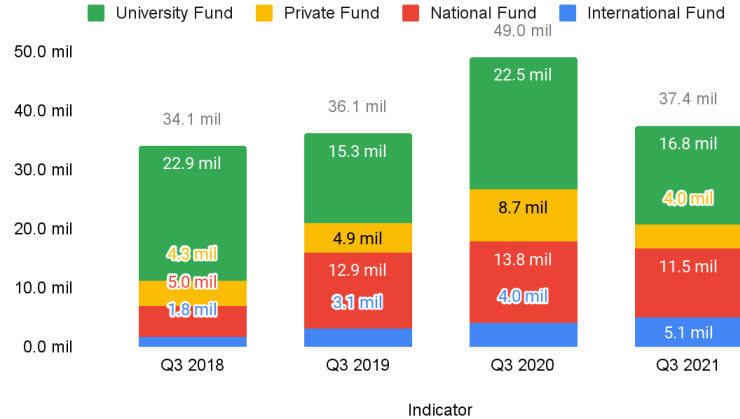
Increased year-on-year  
(2020 vs. 2019)

**+33%**

CAGR (2015 to 2020)

### Research Funding

Quarter-on-quarter performance



**+26%**

Increased quarter-on-quarter performance  
**Funding International**  
(2021-2020)

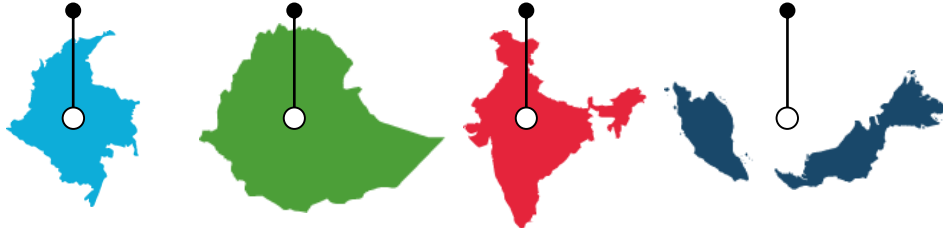
**245**

Research proposals submitted to  
**international** funders in  
Jan - Sept 2021

# Addressing Global Issues: *Water Security*



United Kingdom



Colombia

Ethiopia

India

Malaysia

100+

50+

Researchers from all over the world including from social scientists to hydrologists, economists to microbiologist

Organizations covering institutions of higher learning, water governing bodies and authorities, water related industries



- Water Security and Sustainable Hub is a five-year project that aims to **improve and achieve water security** for a resilient future. Funded by United Kingdom Research and Innovation (UKRI) through Global Challenges Research Fund (GCRF)
- The aim of the Hub's research programme is to build and enhance understanding across water security systems, in order to address **five (5) systemic barriers to water security**

- 1 Insufficient data;
- 2 Unfit service delivery models;
- 3 Fragmented governance;
- 4 Unsuitable solutions to localised problems;
- 5 Limited community involvement.

# Addressing Global Issues: *Alternative/Green Energy*

**SATREPS**

Science and Technology Research Partnership  
for Sustainable Development Program



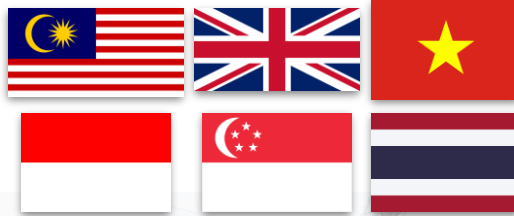
MINISTRY OF HIGHER EDUCATION



Dearman.



# Addressing Global Issues: *Energy/Capacity Building*




- This project will focus on decommissioning of offshore structures in shallow water in ASEAN countries, particularly **Malaysia, Indonesia, Thailand, Vietnam.**
- At present, there are about 1350 offshore structures in Southeast Asia, 800 of which have possibly operated for more than 20 years and thus are reaching the decommissioning stage.
- The project target to come up with a safer decommissioning/recycling of offshore structures in the region.




- This project involves the development of MSc in Food Processing and Innovation with Five EU partners will support 10 Asian HEIs from Malaysia, Cambodia and Thailand and 1 Ministry of Education from.
- The capacity building program looks into the gap of each country and addressing the specific needs accordingly in order to the end-to-end connection value chain on elements of food, focusing on the capacity building on food security.




# Addressing Global Issues: *Transportation*




UTM-LoCARTic is part of the global network of Mitsubishi Turbocharger collaboration network (the only one in SEA).



Both the unique facilities are as a result of a close collaboration between UTM and Imperial College London.



Both facilities valued at RM 14.7 million.



**Low Carbon Transport**

**Imperial College  
London**

**DAIMLER**

 **MITSUBISHI HEAVY INDUSTRIES  
ENGINE & TURBOCHARGER**



**RM 18.5 mil+**

Grant secured from MTJA  
(led by UTM, in collaboration with ICL &  
King Mongkut University)

# Telling Others What We Do

## Issue 1

Delivered to 3,787 contacts in 1,985 institutions over 93 countries

## Issue 2

Delivered to 4,181 contacts in 2,191 institutions over 107 countries

## Issue 3

Delivered to 6,698 contacts in 4,111 institutions over 92 countries



# 50%

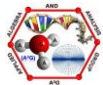
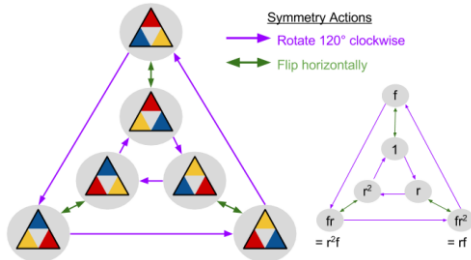
Av. global coverage  
per issue

*Need to view more ?  
Please scan : UTM  
Nexus Research  
Magazine*

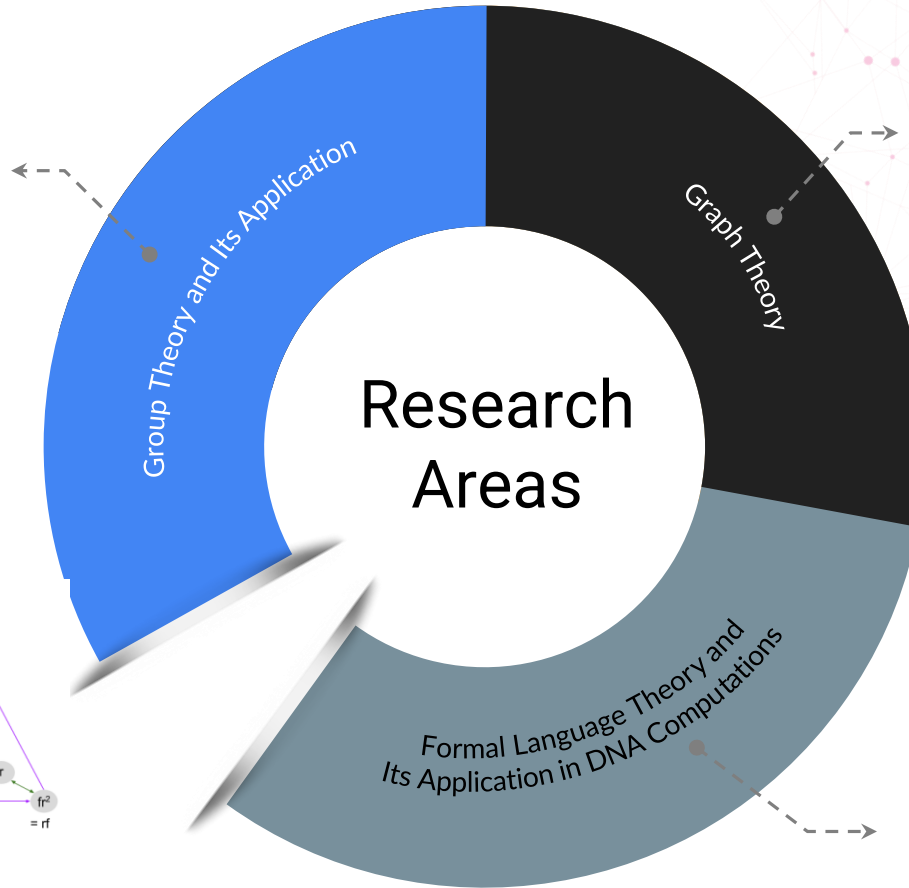


## Group Theory and Ring Theory

- Probability theory in group theory
- Commutative and non-commutative rings
- Conjugacy and order classes of graph



Applied Algebra and Analysis Group (AAAG)



## Applications of Groups in Graph Theory

- Graph representations of some groups
- Prime and co-prime graphs
- Graph of commutative and non-commutative rings
- Topological indices



## DNA Splicing Systems and DNA Sticky Systems

- Some types of DNA splicing systems
- Splicing system on graphs
- Languages and automata of DNA splicing
- Some groups and graphs in splicing system



# My Collaborators Around the World







**Prof. Dr. Ahmad Erfanian**  
**Ferdowsi University of**  
**Masshad, Iran**



**Dr. Sanhan Muhammad**  
**Salih Khasraw**  
**Salahaddin University, Iraq**



**Dr. Mustafa Anis El-Sanfaz**  
**Qatar University**

<https://youtu.be/ZShDj19aoEU>

# THANK YOU



[www.utm.my/international](http://www.utm.my/international)



[relations@utm.my](mailto:relations@utm.my)



UTM International



[utm\\_international](#)



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

In the name of God for Mankind  
[www.utm.my](http://www.utm.my)

Photo credit: Thuy Van Nguyen