



Dr. Lourdes F. Vega  
[lourdes.vega@ku.ac.ae](mailto:lourdes.vega@ku.ac.ae)

Reem Al Orfaly  
[reem.alorfaly@ku.ac.ae](mailto:reem.alorfaly@ku.ac.ae)



جامعة خليفة  
Khalifa University

University of Zaragoza, Spain, 28<sup>th</sup> March 2019

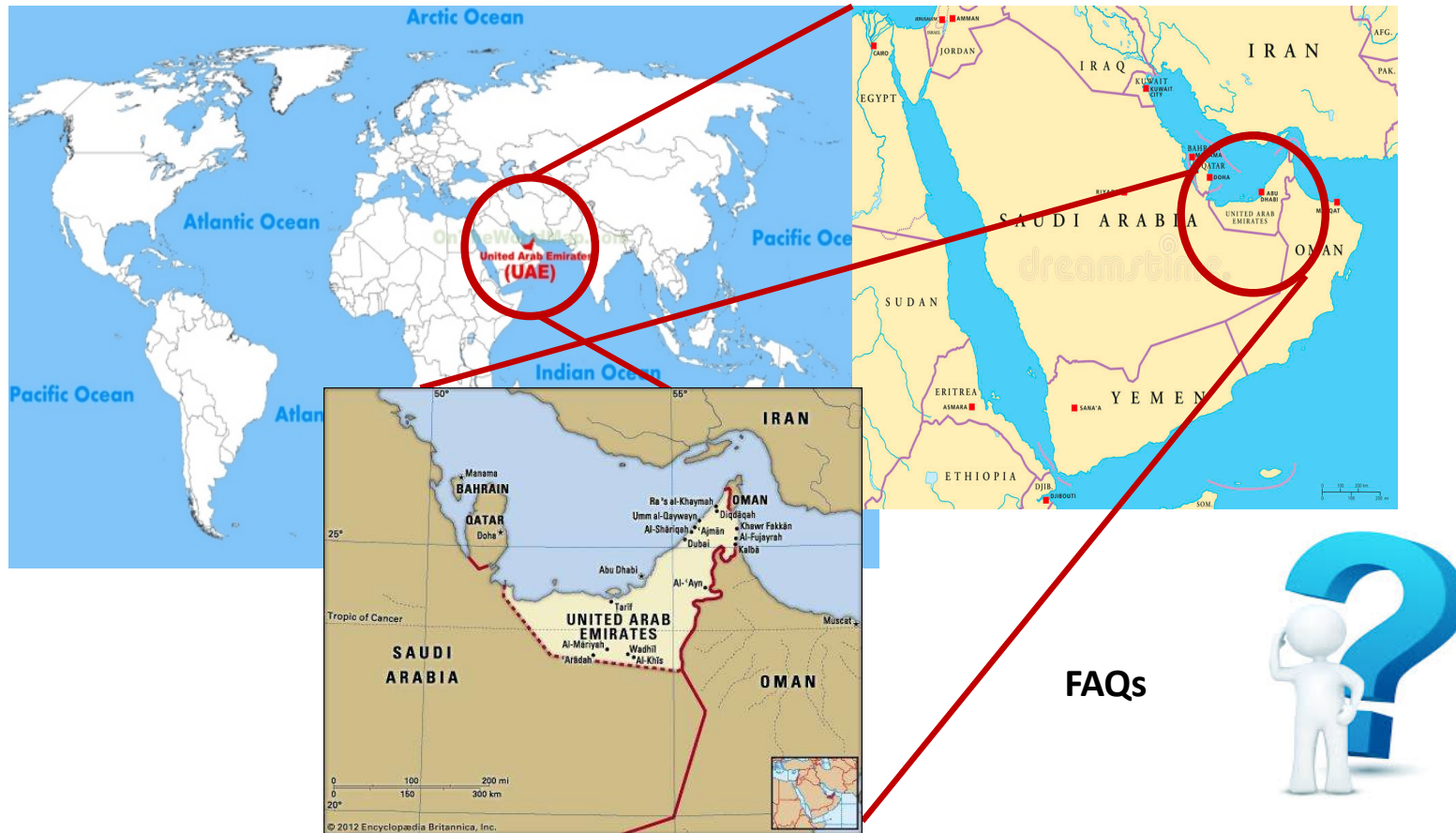
## WHO AM I? PROFESSIONAL EXPERIENCE

1983-88	Bachelor in <b>Physics</b> , Fundamental, <a href="#">U. Sevilla, Spain</a>
1989-89	<b>Assistant Professor</b> , Industrial Engineering, U. Sevilla, Spain
1988-92	<b>PhD in Physics (Stat. Mech.)</b> , Advisors from Physics, Spain, and <b>Chem. Engineering</b> USC, USA
1990-92	<b>Visiting Scholar</b> – Chemical Engineering, <a href="#">Los Angeles, USA</a>
1992-95	<b>Postdoctoral Associate</b> - Chemical Eng. <a href="#">Cornell University, USA</a>
1995-03	Profesor Titular/ <b>Professor</b> – Chemical Eng.– URV, <a href="#">Tarragona, Spain</a>
2003-11	<b>Senior Researcher</b> , Materials Science, CSIC, <a href="#">Barcelona, Spain</a>
2007-15	<b>MATGAS Director</b> & Carburos Metálicos (AP Spain) R&D Director
2012-15	Global <b>Technology Director</b> in <a href="#">Air Products and Chemicals</a>
2015 -	<b>COE and Co-Founder</b> AlyaTech (technology-based company – <a href="#">SP, EU</a> )
2016 -	Independent <b>Member of the Board of Directors</b> , ERCROS, Spain
2016 -	<b>Joint Chair Professor</b> , GRC & ChE – Petroleum Institute, <a href="#">Khalifa University (KU), UAE</a>
2019-	<b>Director</b> , Research and Innovation Center on CO <sub>2</sub> and H <sub>2</sub> (RICH), <a href="#">KU, UAE</a>

# KHALIFA UNIVERSITY

## Vibrant Institution ... Fueling the Future





# ABU DHABI: OUR CITY

**UAE Capital**

**UAE population**

**Abu Dhabi population**

**Language**

**International Community**

Abu Dhabi

9.5 Million

2.9 Million

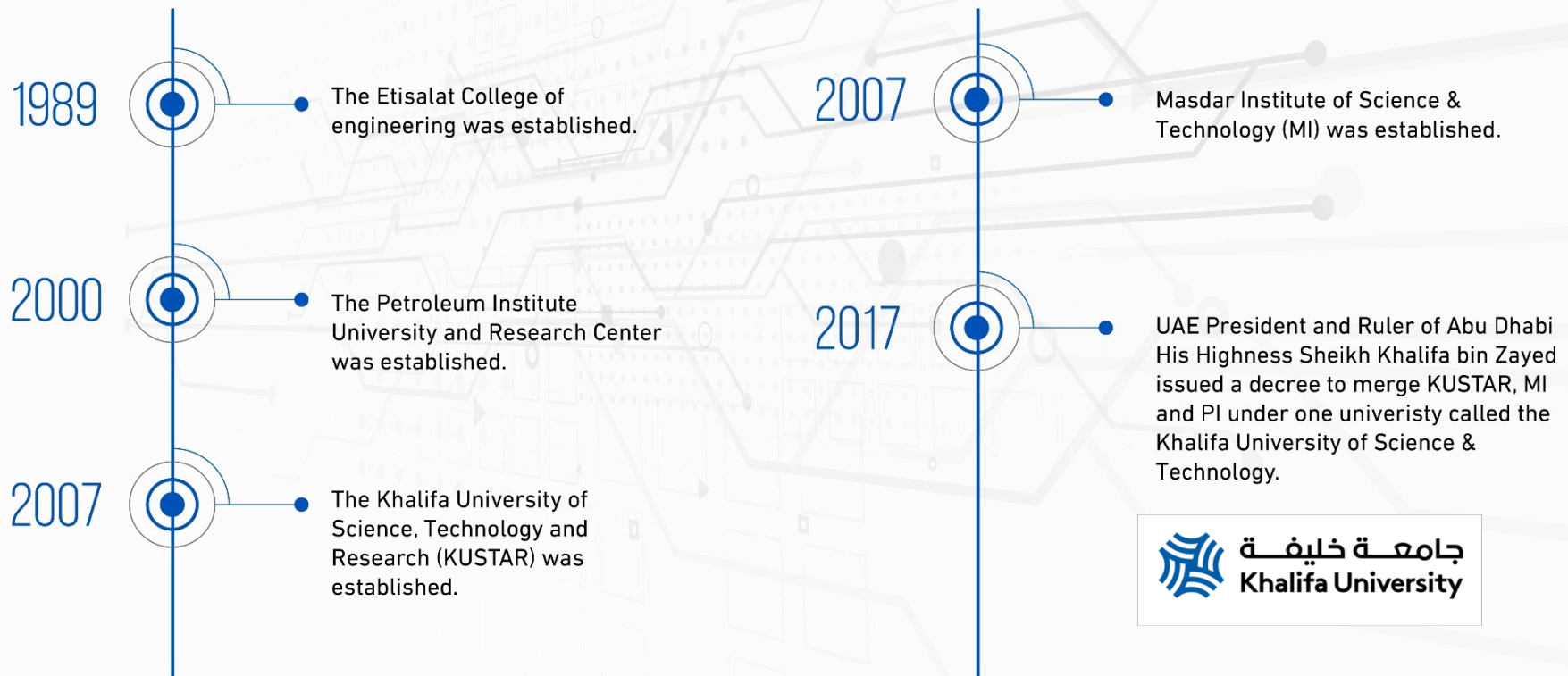
Arabic (official) & English (widely used)

over 180 Nationalities

- Cosmopolitan Modern City
- Safe & Friendly
- Indoor & Outdoor Activities
- Well Connected to other cities including Dubai
- Direct Flights to many International Destinations



# KHALIFA UNIVERSITY HISTORY



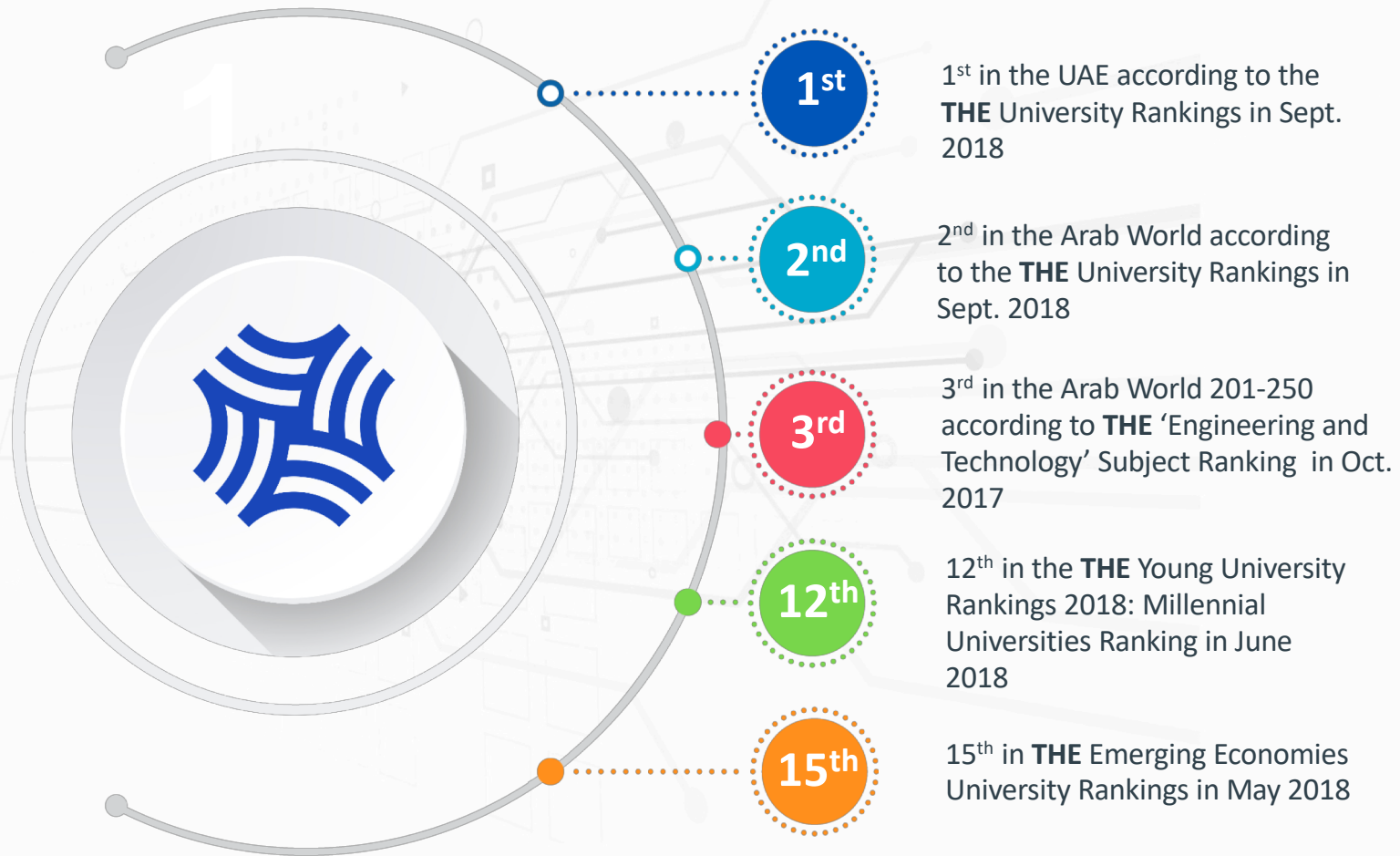
# KHALIFA UNIVERSITY

## OUR CAMPUSES

- Approximately 3500 students
- Nearly 370 international faculty
- Excellent Faculty to Student Ratio: 10:1
- Excellent Facilities across 3 Campuses
- World-Class Research Labs
- International Graduate Students Community
- Three Colleges (Engineering, Arts and Sciences, Medicine and Health Sciences)



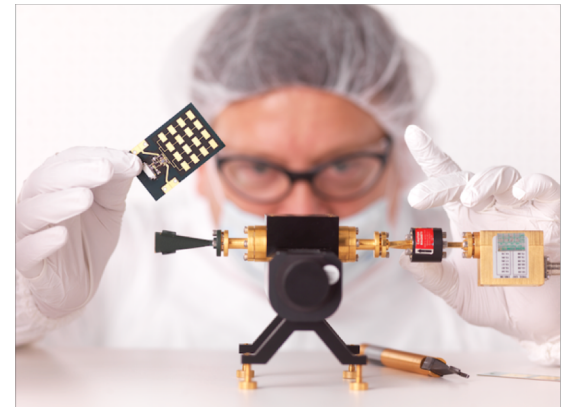
# RANKINGS AND ACHIEVEMENTS



# GRADUATE PROGRAMS – MASTER'S

- MSc in Chemical Engineering
- MSc in Electrical & Computer Engineering
- MSc in Engineering Systems & Management
- MSc in Material Science and Engineering
- MSc in Mechanical Engineering
- MSc in Petroleum Engineering
- MSc in Sustainable Critical Infrastructure
- MSc in Water and Environmental Engineering
- MSc in Computing and Information Science
- MSc in Petroleum Geoscience
- MEng in Health, Safety & Environmental Engineering
- MSc in Applied Chemistry
- MSc in Information Security \*
- MSc in Nuclear Engineering \*
- Master of Arts in International and Civil Security \*

*\* For UAE nationals only*



# GRADUATE PROGRAMS – PhD

- Aerospace Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil Infrastructure and Environmental Engineering
- Electrical and Computer Engineering
- Engineering Systems & Management
- Material Science and Engineering
- Mechanical Engineering
- Nuclear Engineering
- Petroleum Engineering
- Petroleum Geoscience
- Robotics

*\* For UAE nationals only*



# RESEARCH CENTERS

- Research and Innovation Center on CO<sub>2</sub> and H<sub>2</sub> (RICH)
- Advanced Power and Energy Center (APEC)
- Sustainable Bioenergy Research Consortium (SBRC)
- Center for Membranes and Advanced Water Technology (CMAT)
- Center for Catalysis and Separation (CeCaS)
- Gas Research Center (GRC)
- Aerospace Research and Innovation Center (ARIC)
- Healthcare Engineering Innovation Center (HEIC)
- Center for Biotechnology (BTC)
- System-on-Chip Center (SoCC)
- KU Center for Cyber-Physical Systems (C2PS)
- KU Center for Autonomous Robotic Systems (KUCARS)
- Nuclear Technology Center (NTC)
- Center of Excellence on RF/5G Communications
- Center of Excellence on Integrated Photonics
- Emirates ICT Innovation Center (EBTIC)
- Research Center for Renewable Energy Mapping & Assessment (ReCREMA)





## Research Themes

- CO<sub>2</sub> Capture**  
Develop novel materials and high efficient processes for CO<sub>2</sub> capture and separation ready for EOR & Conversion
- CO<sub>2</sub> Utilization**  
Develop advanced materials & processes to convert CO<sub>2</sub> into CO<sub>2</sub>-neutral valuable products
- H<sub>2</sub> Production, Storage, Distribution**  
Establish technologies to utilize H<sub>2</sub> in a low-carbon-footprint economy
- Outreach Activities**  
Establish education and training platform on CO<sub>2</sub> & H<sub>2</sub>  
Disseminate knowledge and best practices  
Foster academic & industrial collaboration

## Vision & Mission

The center aims to become a world leading hub in the development of novel materials and technologies for CO<sub>2</sub> capture and utilization as well as H<sub>2</sub> production, storage and distribution using modeling and experimental approaches.

RICH is the main center of excellence in the UAE to carry out state-of-the-art research and innovation in the context of carbon-neutral energy, deploy clean energy and value-added products, generate intellectual property, pursue knowledge exchange and education, develop Emirati human capacity, and diversify the UAE economy while helping to mitigate climate change.

## Stakeholders and Collaborators



## Ongoing Projects

- Novel materials for CO<sub>2</sub> capture
- Advanced CO<sub>2</sub> capture processes evaluation and integration
- Solar-driven conversion of CO<sub>2</sub> into fuels and high added value materials
- Machine learning approach for novel materials development
- Direct use of CO<sub>2</sub>: from waste to materials
- Materials and Systems for H<sub>2</sub> production and storage
- Ammonia as a carbon-less fuel using hydrogen
- Integrated approach for strategic planning of H<sub>2</sub>/CO<sub>2</sub> networks

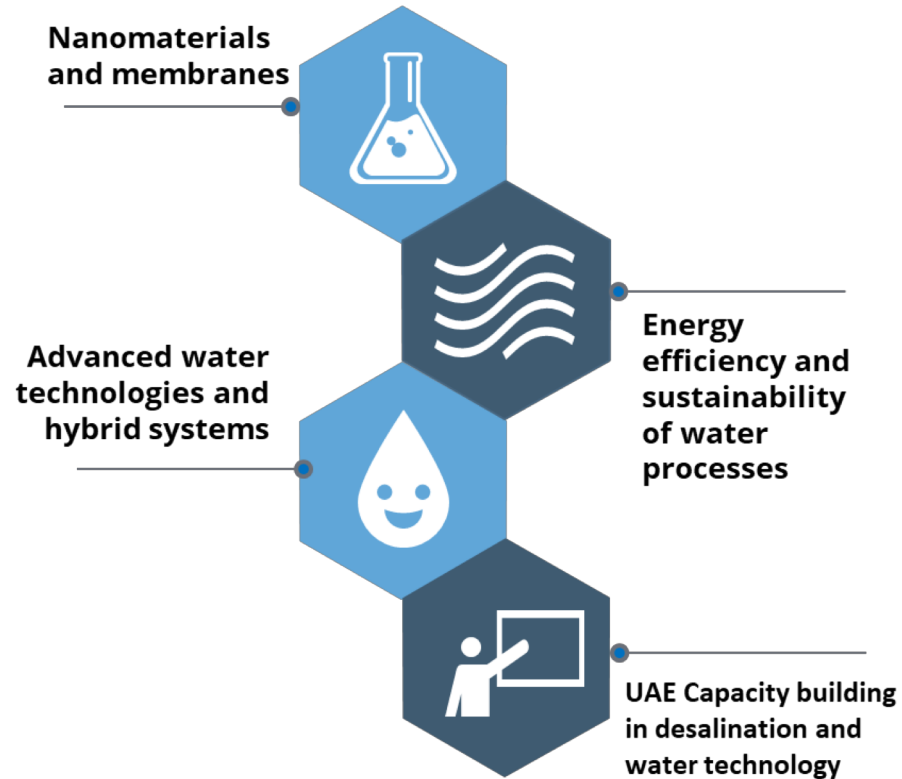
## Center Leadership



Contact: [lourdes.vega@ku.ac.ae](mailto:lourdes.vega@ku.ac.ae)

## Center for Membrane and Advanced Water Technology (CMAT)

**CMAT Mission is to undertake multidisciplinary collaborative research to cover the following themes:**



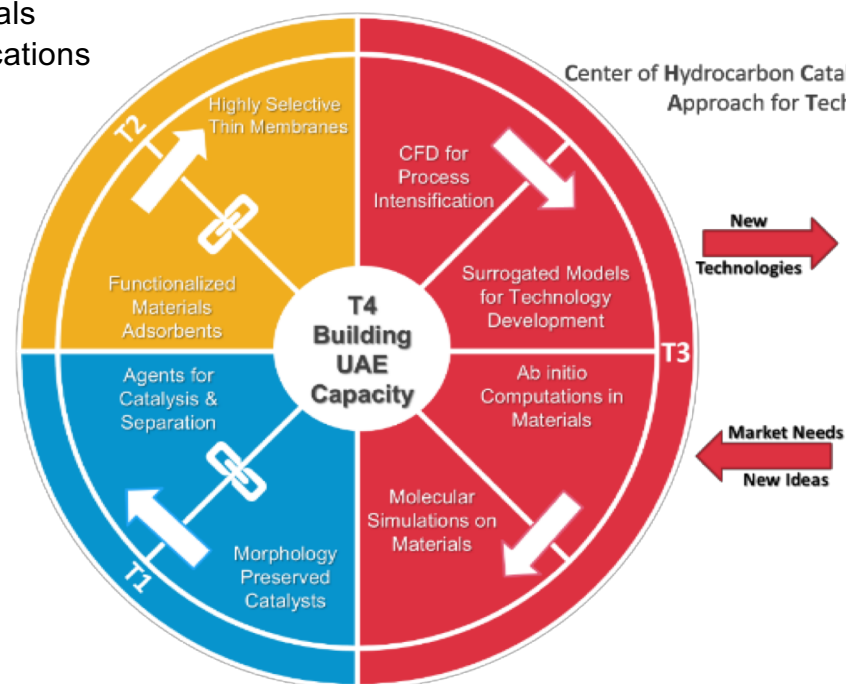
Contact: [hassan.arafat@ku.ac.ae](mailto:hassan.arafat@ku.ac.ae)

# Center for Catalysis and Separation (CeCaS)

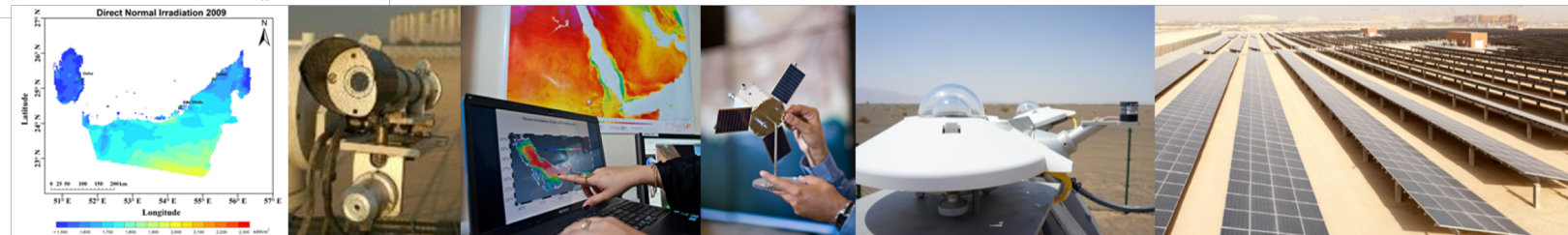
**T1:** Catalysis for Energy and Chemicals

**T2:** Adsorption and Separation Applications

**T3:** Multiscale Modeling



Contact: [kyriaki.polychrono@ku.ac.ae](mailto:kyriaki.polychrono@ku.ac.ae)



## Research Center for Renewable Energy Mapping and Assessment (ReCREMA)

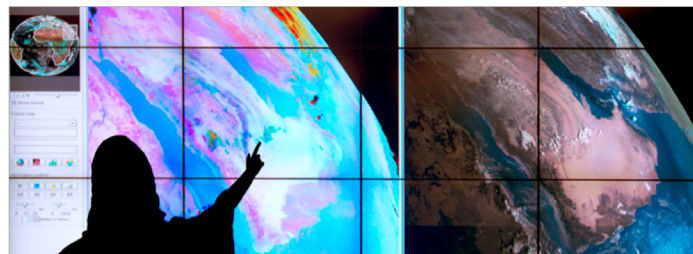
Since its establishment in **2012**, ReCREMA has succeeded to gain international recognition as a pivotal hub for advancing research and innovation in tackling the challenge of estimating solar potential for arid and dusty environments. The Center has succeeded in developing regional knowledge and leadership in renewable energy assessment and mapping for the Arabian Peninsula and countries with similar climate, mainly in Africa.

### Key Outcomes:

- Fully independent financially. **\$20M** of research contracts raised over the last 5 years.
- Mandated by the UAE Government to develop the **UAE wind and solar atlases**.
- The research team include **8-12 full time research staff** (scientists, postdocs and research engineers)
- ReCREMA has become a **regional research hub** for renewable energy mapping and assessment in desert environment: **UAE, Kuwait, Qatar, Saudi Arabia, Egypt, Oman**.
- Playing a pro-active role in bringing **IRENA's Global Atlas Project** to the UAE. The Global atlas servers are presently hosted at Masdar Institute Data Center; operated and maintained by ReCREMA engineers.
- Mandated by the Saudi Government (KA CARE) to develop the **Saudi Solar Atlas**.
- Presently operating the solar **forecasting system for the Kingdom**

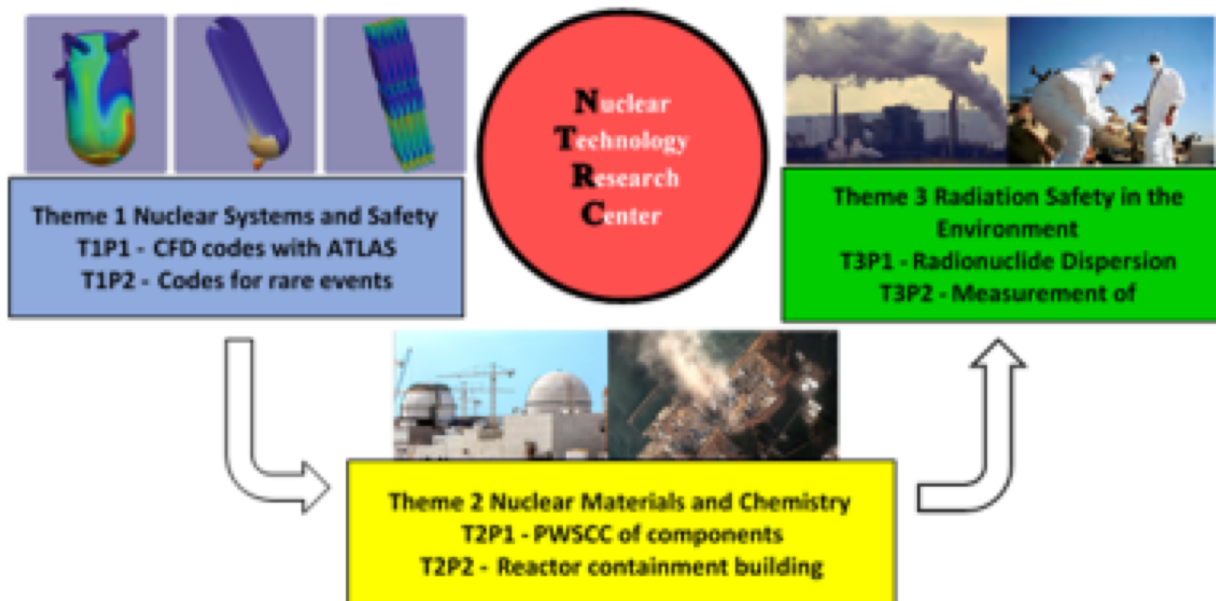
### Key Facilities and Products

- The Center has its own satellite receiving station with dedicated High Performance Computing clusters for real-time data processing and extended storage capacity.
- 400 Tb of storage capacity
- Developed a wide range of operational products and interactive online tools for renewable energy assessment, environmental monitoring and weather modelling.



Contact: [hosni.ghedira@ku.ac.ae](mailto:hosni.ghedira@ku.ac.ae)

مركز التكنولوجيا النووية  
Nuclear Technology Center



# GRADUATE SCHOLARSHIPS – MSC & PHD

- Full coverage of tuition fees
- Medical insurance coverage for students under the Khalifa University visa.
- Support to attend international research conferences.
- Monthly stipend for GRTA Scholarship:
  - During MSc: AED 8,000 (Approx. EUR 2,000)
  - During PhD: AED 10,000 (Approx. EUR 2,500)

## For more information

<https://www.ku.ac.ae/admissions/graduate-admissions/graduate-scholarships/>

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# GRADUATE ADMISSION REQUIREMENTS

Admission to Khalifa University of Science and Technology is highly competitive and the selection of applicants will be based on the application form, supporting documents and performance in the interview. Selection will take into account factors such as academic performance, qualifications and previous experience, CV, reference forms and the applicant's potential to succeed.

## Master's Degree Program Applicants

- Completion of a Bachelor's degree in a relevant discipline with a minimum Cumulative Grade Point Average (CGPA) of 3.0 out of 4.0, or equivalent (e.g. an upper second-class honors in a UK-style degree, from a reputable accredited institution).
- A minimum level of English proficiency in the form of either:
  - iBT TOEFL (internet-based test) score of 91 or equivalent, or
  - Overall academic IELTS score of 6.5, or
  - 1550 EmSAT English score
- A minimum quantitative score of 150 in the general Graduate Record Examination (GRE)



# GRADUATE ADMISSION REQUIREMENTS

## Doctorate Degree Program Applicants

- Completion of a Master's degree in a relevant discipline with a minimum CGPA of 3.25 out of 4.0, or equivalent (e.g. an upper second-class honors in UK-style Master by taught courses with a minimum average of 63% or a Pass in a Master by Research/MPhil) from a reputable accredited institution.
- A minimum level of English proficiency in the form of either:
  - iBT TOEFL (internet-based test) score of 91 or equivalent, or
  - overall academic IELTS score of 6.5, or
  - 1550 EmSAT English score
- A minimum quantitative score of 150 in the general Graduate Record Examination (GRE) is required for admission to all Doctorate programs. Applicants for all programs should attempt all three sections of the GRE.

# HOW TO APPLY

Online application for Fall 2019 is now open at  
<https://admissions.kustar.ac.ae/pg/Account/Login>

**Deadline** 30 April 2019

**Email** [pgadmission@ku.ac.ae](mailto:pgadmission@ku.ac.ae)



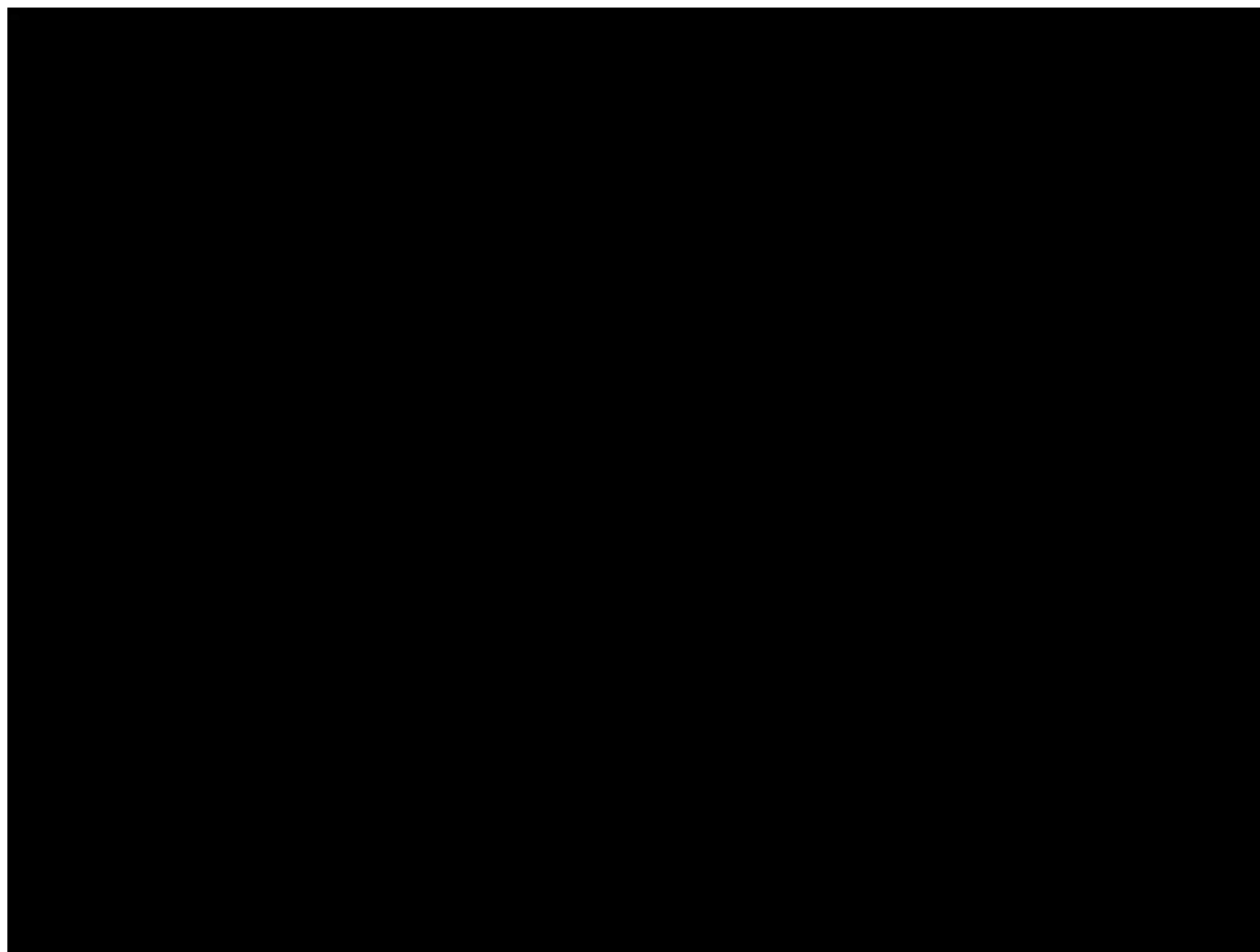
# STUDENT LIFE

Khalifa University strongly supports and works closely with students to optimize their campus life experience during their educational journey. Students are involved in and undertaking the responsibilities of helping to organize major events and celebrations such as the National and International Day, KU Bazaar, Film Festival, and Open Day.



# KHALIFA UNIVERSITY

## Inspiring Environment ... LIVE & STUDY



# SPANISH STUDENTS GRADUATED IN PREVIOUS YEARS

Where do they work now?

Programe	Year/Sem	Position	Company	Location	Gender
CHE	1602	Consultant	Burotec	París	M
EPE	1402	Manager Data Analysis	Etihad Airways	Abu Dhabi	F
ESM	1202	Unknown	Unknown	Unknown	F
MEG	1502	R&D Hardware	IDNEO	Barcelona	M
MEG	1302	Consultant Associate	Oliver Wyman	Madrid	M
MEG	1402	PhD student	Khalifa University	Abu Dhabi	M
MEG	1302	Sen. Vice President, Product & Ops.	Coverwallet Insurance	New York	M
MEG	1402	Engineering consultant	EnergyNest	Sevilla	M
MEG	1402	Senior financial consultant	NFQ advisory	Madrid	M
MSE	1503	PM Officer	AERTEC	Madrid	M
MSE	1502	Process Engineer	Bosch	Madrid	M
MSE	1402	Team manager	Drivex Motorsport	Madrid	M
SCI	1602	Energy Auditor	Smart4Power	Dubai	M
WEN	1402	Project Officer JRC	European Commision	Italy	F
WEN	1302	Associate Professional	IRENA	Abu Dhabi	F

## OTHER POSSIBILITIES – STUDENTS EXCHANGE

- **Visiting students:** possibility of co-advising

As part of the master or PhD students

**Duration:** from 1 month to 9 months, depending on the project and available resources

**How:** collaboration and arrangement at faculty level

**Salary:** around 10000 AED/month (depending on resources)

**Life:** as our graduate students

- Graduate students from KU can also visit other international universities
  - Sabbatical leaves for professors are also possible
  - Bilateral projects and participation in EU funded or other international projects
-

## RECENT VISITING STUDENTS IN MY GROUP

Student	University	Year	Duration	Program
E. Cané	IQS, U. Ramon Llull, Barcelona	2016-2017	9 months	Master of Science (Thesis)
E. Pelegrin	IQS, U. Ramon Llull, Barcelona	2017-2018	6 months	Master of Science (Thesis)
A. Tuneu	IQS, U. Ramon Llull, Barcelona	2017-2018	6 months	Master of Science (Thesis)
E. Crespo	U. Aveiro, Portugal	2016-2017 2017-2018	3 months 1 months	PhD
J. Justino	ITS, U. Lisboa, Portugal	2018-2019	3 months	Master of Science (part of the Thesis)
M. Ferreira	U. Nova Lisboa, Portugal	2018-2019	2 months	PhD
C. Martinez	IQS, U. Ramon Llull, Barcelona	2018-2019	3 months	Master of Science (part of the Thesis)
J. Duarte	ITS, U. Lisboa, Portugal	2018-2019	3 months	Master of Science (part of the Thesis)

# HOW TO APPLY

Online application for Fall 2019 is now open at  
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**Deadline** 30 April 2019

**Email** ***[pgadmission@ku.ac.ae](mailto:pgadmission@ku.ac.ae)***

Para cualquier consulta podéis contactarme directamente.  
También puedo poneros en contacto con otros estudiantes que haya estado allí por si queréis saber algo mas del ambiente, estudios, posibilidades, etc.

**Dr. Lourdes F. Vega**

**GRC Joint Chair Professor**

**Director, Research and Innovation Center on CO2 and H2 (RICH Center)**

**Chemical Engineering Department**



Bu Hasa Building, office 2204

P O Box 127788, Abu Dhabi, UAE

T +971 2 607 5626

**[lourdes.vega@ku.ac.ae](mailto:lourdes.vega@ku.ac.ae)**

Director of recruiting: Reem Al Orfaly: **[reem.alorfaly@ku.ac.ae](mailto:reem.alorfaly@ku.ac.ae)**

# THANK YOU!

