AI-Mat Frontier Workshop on:

Opportunities and Challenges for CO_2 Reduction Reaction

July 5th 2023

Venue: CCMS, R212

Talks	Topic	Speaker	Time
Opening Remarks			
1	Brief introduction of the purpose and objectives of the workshop	**Prof. Li-Chyong Chen**	10:00 – 10:05
Keynote lecture (1hour including Q&A)			
2	Crucial Role of Microenvironments in Photochemical and Electrochemical CO and CO_2 Reduction	**Prof. Joel W. Ager**	10:05- 11:05
Invited talks (25 min each, including Q&A)			
3	Manipulating Spin-Polarized Electrons for Photocatalytic CO_2 Reduction	**Prof. Chun-Wei Chen**	11:05- 11:30
4	In-situ infrared spectroscopy studies of electrocatalytic and photocatalytic CO_2 reactions	**Prof. Heng-Liang Wu**	11:30-11:55
5	What can first principle simulations do for experimentalists? CO_2 adsorption processes on and geometrical structures of 2D transition metal dichalcogenides	**Prof. Michitoshi Hayashi**	11:55-12:20
Lunch Break			**12:20- 13:20**

Surface Reaction and Mechanism of CO_2 Reduction (15 min each, including Q&A)			
6	Unveiling the mechanistic reaction pathway of photocatalytic CO_2 reduction over 2D $ZnIn_2S_4$	**Dr. Amr Sabbah**	13:20 – 13:35
7	Theoretical Study on CO_2 Reduction Using 2D Materials: Exploring Active Sites for CO_2 Activation	**Dr. Ying-Ren Lai**	13:35 – 13:50
8	Dopant–vacancy pairing in CVLS-grown ultrathin Mo1-xVxS2-y for CO_2 to CO photoreduction	**Dr. Mohammad Qorbani**	13:50 – 14:05
9	Strain Engineering in Ultrathin MoS_2 Catalysts for Selective Photocatalytic CO_2 Reduction	**Chih-Yang Huang**	14:05– 14:20
10	Photocatalytic CO_2 reduction to CH_4 via stabilization of COOH and CHO intermediates over phosphorus implanted SnS_2 thin film	**Tadios Tesfaye**	14:20– 14:35
11	Surface Modification for understanding Photocatalytic CO_2 reduction	**N. Q. Thang**	14:35 – 14:50
Coffee Break			**14:50- 15:05**
12	Combinatory Modification of Metal-Free g-C_3N_4 for Photocatalytic CO_2 Reduction	**Dr. Mahmoud Kamal**	15:05– 15:20
13	Electronic Regulation of Nickel Single Atom Catalyst for Efficient CO_2 Electroreduction	**Mengestu**	15:20– 15:35
14	Scanning Electrochemical Microscopy of 2D materials	**Septia**	15:35 – 15:50
15	Highly soluble organic molecules catalyzed photoreduction of CO_2 with isotope reactants	**Kuang-Hao Cheng**	15:50- 16:05

	Open Discussion and Q&A		
	• Opportunities for scaling up CO_2 reduction technologies. • Addressing questions, sharing insights, and exploring new ideas.		16:05- 16:20
	Summary and Closing Remarks		
	• Recap of key points discussed during the workshop. • Thanking the presenters and participants for their contributions. • Future Directions and potential collaboration.		16:20- 16:30

Note: Lunch boxes will be Provided during the lunch break.

Coffee and tea will be provided at all times in the meeting venue.