

ISPCEM

PROGRAMME

# 5<sup>th</sup> International Symposium on Plasmas for Catalysis and Energy Materials (ISPCEM)

Sunday 3<sup>rd</sup> July – Thursday 7<sup>th</sup> July 2022  
University of Liverpool, UK



UNIVERSITY OF  
LIVERPOOL

## Welcome

Dear Colleagues,

It is our great pleasure to invite you to participate in the 5<sup>th</sup> International Symposium on Plasmas for Catalysis and Energy Materials (ISPCEM) which will be held in a hybrid mode in Liverpool, UK, from 3<sup>rd</sup> - 7<sup>th</sup> July 2022.

This symposium will bring together participants from academia and industry to discuss and exchange cutting-edge scientific innovations and technological advances in emerging plasma technologies for energy and environmental catalysis as well as the synthesis and applications of energy materials. This conference will provide a cross-disciplinary platform for scientists and engineers to share knowledge and experiences, discuss future development and build new collaborations. The working language of this symposium is English.

On behalf of the Local Organising Committee, we look forward to your contributions and participation in the 5<sup>th</sup> ISPCEM and to seeing all of you in Liverpool. We wish you all a wonderful and inspiring stay in Liverpool.

Yours sincerely,



Prof. Xin Tu  
Chair of the 5<sup>th</sup> ISPCEM

## Committees

### International Scientific Committee

- Annemie Bogaerts – *University of Antwerp, Belgium*
- Sylvain Coulombe – *McGill University, Canada*
- David Go – *University of Notre Dame, USA*
- Changjun Liu – *Tianjin University, China*
- Davide Mariotti – *Ulster University, UK*
- Tony Murphy – *CSIRO, Australia*
- Tomohiro Nozaki – *Tokyo Institute of Technology, Japan*
- Gottlieb Oehrlein – *University of Maryland, USA*
- Antoine Rousseau – *Ecole Polytechnique, France*
- Xin Tu – *University of Liverpool, UK*
- Aimin Zhu – *Dalian University of Technology, China*

### International Advisory Committee

- Pascal Brault – *Université d'Orléans, France*
- Yi Cheng – *Tsinghua University, China*
- Wei Chu – *Sichuan University, China*
- Baldur Eliasson – *Eliasson & Associates, Switzerland (Honor)*
- Masaru Hori – *Nagoya University, Japan*
- Ben W.L. Jang – *Texas A&M University-Commerce, USA*
- Hyungjun Kim – *Yonsei University, South Korea*
- Young Sun Mok – *Jeju National University, South Korea*
- Erik C. Neyts – *University of Antwerp, Belgium*
- Kostya (Ken) Ostrikov – *Queensland University of Technology, Australia*
- Mohan Sankaran – *Case Western Reserve University, USA*
- Ch. Subrahmanyam – *Indian Institute of Technology Hyderabad, India*
- M.C.M. van der Sanden – *DIFFER, Netherland*
- J. Christopher Whitehead – *The University of Manchester, UK*
- Xinhui Xing – *Tsinghua University, China*

- Yanhui Yang – *Nanjing University of Technology, China*

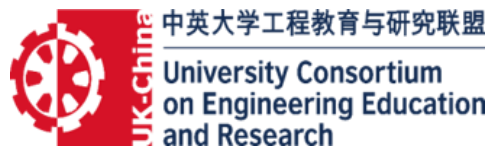
### **Local Organising Committee**

- Xin Tu – *University of Liverpool, UK (Conference Chair)*
- Yaolin Wang – *University of Liverpool, UK*
- Jonathan Harding – *University of Liverpool, UK*
- Nantao Wang – *University of Liverpool, UK*
- Chao Xu – *University of Liverpool, UK*
- Xiaolei Fan – *The University of Manchester, UK*
- Shaojun Xu – *Cardiff University, UK*

## Sponsor

The conference organiser wishes to acknowledge the support of the following organisation:

- UK-China Construction of Engineering  
Education & Research



## General Information

### 1. University of Liverpool Campus Map

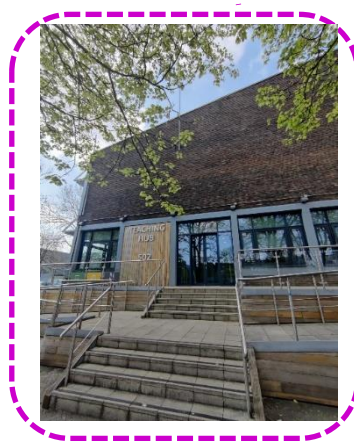
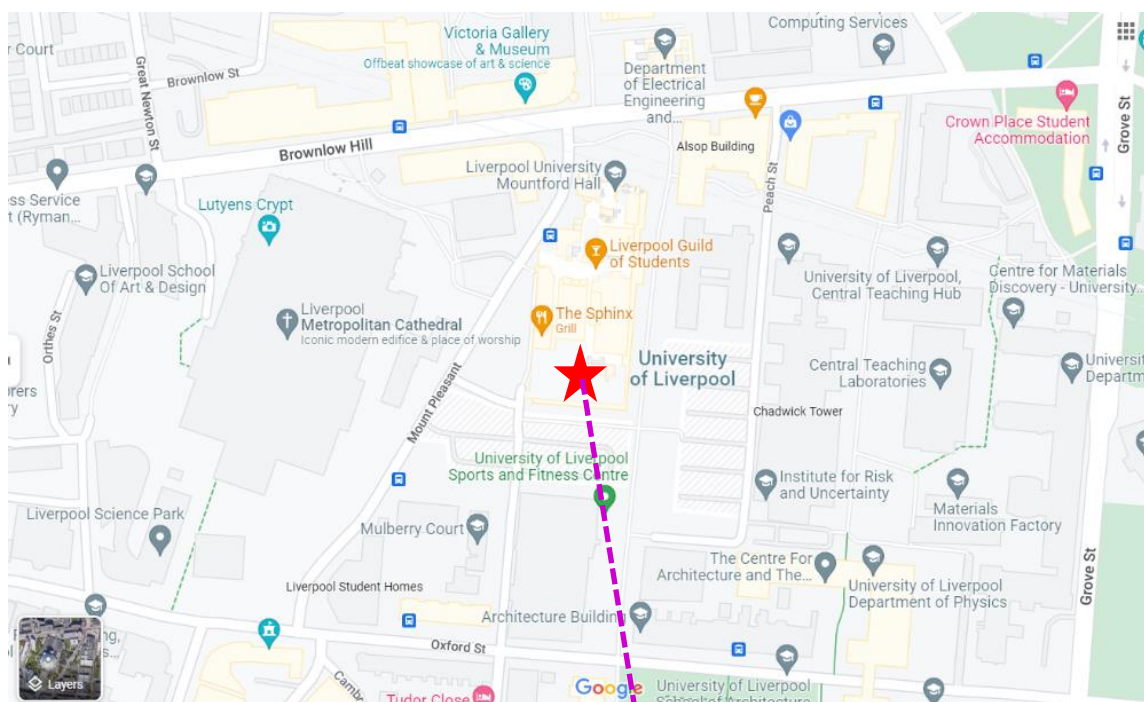
The conference will be held on the main campus of the University of Liverpool, and the campus map is attached for your reference.

<https://www.liverpool.ac.uk/files/docs/maps/liverpool-university-campus-map.pdf>

### 2. Registration Venue (Opening @15:00, 3<sup>rd</sup> July)

Lecture Theatre 3 (LT 3), 502 Teaching Hub (Building No. 502 on the campus map).

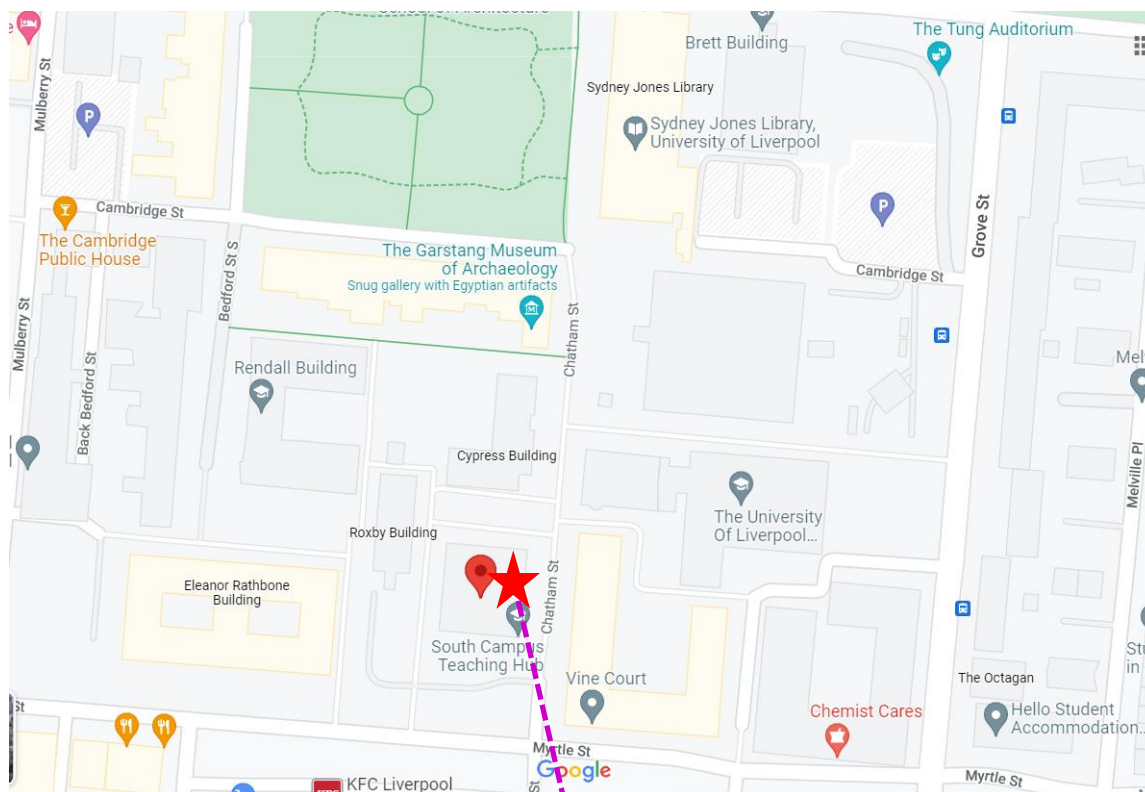
Address: 502 Teaching Hub, Liverpool, L69 7ZP



### 3. Conference Venue (4<sup>th</sup> to 7<sup>th</sup> July)

Lecture Theatre 1 & 2 (LT 1 & 2), South Campus Teaching Hub (Building No. 120 on the campus map).

Address: 140 Chatham Street, Liverpool, L7 7BA



## 4. Programme Overview

### Abbreviations:

**PL** - Plenary; **KN** - Keynote; **O** - Oral; **P** - Poster;  
**SCTH** - South Campus Teaching Hub; **LT** - Lecture Theatre;  
**UK time** - British Summer Time (BST), UTC+1.

03/07/2022 (Sunday)	04/07/2022 (SCTH, Monday)				05/07/2022 (SCTH, Tuesday)				06/07/2022 (SCTH, Wednesday)				07/07/2022 (SCTH, Thursday)	
15:00 – 18:00 Registration (LT3, 502 Teaching Hub)	08:00 - 09:00		<b>Registration</b>											
	08:40 - 09:00		<b>Welcome</b>											
	09:00 – 09:45		<b>PL-1</b>		09:00 – 09:45		<b>PL-2</b>		09:00 – 09:45		<b>PL-3</b>		<b>Session 1</b>	
	<b>Session 1</b>		<b>Session 2</b>		<b>Session 1</b>		<b>Session 2</b>		<b>Session 1</b>		<b>Session 2</b>		09:00 – 09:30	<b>KN-8</b>
	09:45 – 10:00	O-1	09:45 – 10:00	O-8	09:45 – 10:00	O-23	09:45 – 10:00	O-30	09:45 – 10:00	O-45	09:45 – 10:00	O-48	09:30 – 09:45	O-55
	10:00 – 10:15	O-2	10:00 – 10:15	O-9	10:00 – 10:15	O-24	10:00 – 10:15	O-31	10:00 – 10:15	O-46	10:00 – 10:15	O-49	09:45 – 10:00	O-56
	10:15 – 10:30	O-3	10:15 – 10:30	O-10	10:15 – 10:30	O-25	10:15 – 10:30	O-32	10:15 – 10:30	O-47	10:15 – 10:30	O-50	10:00 – 10:15	O-57
	10:30 – 11:00		<b>Coffee break</b>		10:30 – 11:00		<b>Coffee break</b>		10:30 – 11:00		<b>Coffee break</b>		10:15 – 10:45	<b>Coffee break</b>
	11:00 – 11:30		<b>KN-1</b>		11:00 – 11:30		<b>KN-4</b>		<b>Session 3</b>				<b>Session 2</b>	
	<b>Session 3</b>		<b>Session 4</b>		<b>Session 3</b>		<b>Session 4</b>		11:00 – 11:30		<b>KN-7</b>		10:45 – 11:15	<b>KN-9</b>
	11:30 – 11:45	O-4	11:30 – 11:45	O-11	11:30 – 11:45	O-26	11:30 – 11:45	O-33	11:30 – 11:45			O-51	11:15 – 11:30	O-58
	11:45 – 12:00	O-5	11:45 – 12:00	O-12	11:45 – 12:00	O-27	11:45 – 12:00	O-34	11:45 – 12:00			O-52	11:30 – 11:45	O-59
	12:00 – 12:15	O-6	12:00 – 12:15	O-13	12:00 – 12:15	O-28	12:00 – 12:15	O-35	12:00 – 12:15			O-53	11:45 – 12:00	O-60
	12:15 – 12:30	O-7	12:15 – 12:30	O-14	12:15 – 12:30	O-29	12:15 – 12:30	O-36	12:15 – 12:30			O-54	12:00 – 12:15	O-61
12:30 – 14:00		<b>Lunch</b>		12:30 – 14:00		<b>Lunch</b>		12:30 – 13:30		<b>Lunch</b>		12:15 – 12:30	O-62	
<b>Session 5</b>				14:00 – 14:30		<b>KN-5</b>						12:30 – 14:00	<b>Lunch</b>	
14:00 – 14:30		<b>KN-2</b>		14:30 – 15:00		<b>KN-6</b>								
14:30 – 14:45		O-15		<b>Session 5</b>		<b>Session 6</b>								
14:45 – 15:00		O-16		15:00 – 15:15	O-37	15:00 – 15:15	O-41							
15:00 – 15:15		O-17		15:15 – 15:30	O-38	15:15 – 15:30	O-42							
15:15 – 15:30		O-18		15:30 – 15:45	O-39	15:30 – 15:45	O-43							
15:30 – 16:00		<b>Coffee break</b>		15:45 – 16:00	O-40	15:45 – 16:00	O-44	13:30 – 17:00		Liverpool FC Tour				
<b>Session 6</b>				16:00 – 16:15		<b>Coffee break</b>								
16:00 – 16:30		<b>KN-3</b>												
16:30 – 16:45		O-19												
16:45 – 17:00		O-20		16:15 -17:30		<b>Poster session</b>								
17:00 – 17:15		O-21												
17:15 – 17:30		O-22												
18:30		<b>Dinner</b>		19:15		<b>Dinner</b>		19:30		<b>Dinner</b>				



## 5. Conference Meals

The conference meals are as follows.

	Lunch	Dinner
4 <sup>th</sup> July, Monday	South Campus Teaching Hub	Sapporo Teppanyaki Liverpool (18:30) Address: 134 Duke Street, East Village, Liverpool, L1 5AG
5 <sup>th</sup> July, Tuesday	South Campus Teaching Hub	Bon Pan Liverpool (19:15) Address: 45-49 Clayton Ln, Liverpool L1 1QR
6 <sup>th</sup> July, Wednesday	South Campus Teaching Hub	Adelphi Hotel (19:30) Address: Ranelagh Place, Liverpool, L3 5UL
7 <sup>th</sup> July, Thursday	Packed lunch	N/A

## 6. Liverpool FC Tour

**Time:** 6<sup>th</sup> July 2022, 14:30 - 17:00;

**Pick up time and point:** 13:30, the bus stop on Grove Street near the Yoko Ono Centre at the University of Liverpool (Oxford Street, Liverpool, L7 3NY);

**Return time:** 16:30 - 17:00;

**Drop off point for return journey:** Adelphi Hotel;

**Description of the tour:**

1. Visit Anfield Stadium, the home of one of England's most successful clubs - Liverpool FC. As the winners of 19 league championships, 6 European Cups, and 8 FA Cups, Liverpool FC is bursting at the seams with history.
2. Enter Anfield Stadium, the once footballing home to the likes of English legend Steven Gerrard and Barcelona Super-striker Luis Suarez, and immerse yourself in the world of Liverpool FC. During your tour, you'll see the state-of-the-art Home Team dressing room and have the chance to sit in your hero's seat before heading over to the away team dressing room.
3. Have a real footballing moment in the Press Room with your tour guide for a fun and interactive press conference where you'll be sure to feel the pressure.
4. Discover more about Liverpool's hugely successful football record in The Liverpool FC Story, the Club's interactive museum. See the achievements of the 19/20 season squad, pay homage to the players and get up close and personal to the impressive silverware collection.

## 7. Internet

Free Wi-Fi will be available in the conference venue.

## 8. Contact

If you have any questions during the conference, please do not hesitate to contact the Local Organising Committee.

Email: [ispcem@liverpool.ac.uk](mailto:ispcem@liverpool.ac.uk)

Mobile: 07586717223 (Chao Xu)

07529145309 (Nantao Wang)

## 9. Additional Notes (In-person only)

**All fully registered participants are entitled to:**

- Admission to all scientific sessions
- Access to the poster area
- Conference materials
- Welcome reception
- Lunches (Monday to Thursday)
- Dinner (Monday to Wednesday)
- Coffee/tea during the breaks
- Liverpool FC tour

The conference organiser is not liable for personal accidents or loss/damage of the private properties of registered participants during the conference. Participants are encouraged to make their own arrangements for personal insurance.

The conference organiser is not responsible for any personal expenses incurred or any loss suffered by delegates or their guests in connection with the conference.

## Information for Oral & Poster Presentations

### **Information for Oral Presentations**

- Plenary Lectures (45 min, including 5 min Q&A)
- Invited Lectures (30 min, including 5 min Q&A)
- Oral Presentations (15 min, including 3 min Q&A)
- The lecture theatre is equipped with a Windows PC. Supported presentation formats are Microsoft PowerPoint and PDF. Please have your presentation ready on a portable USB stick (pen drive), and it is advised to copy the files to the computer in advance.

### **Information for Poster Presentations**

- Format A0: 841 mm in width and 1188 mm in high.
- Poster sessions are scheduled on 5<sup>th</sup> July, from 16:15 to 17:30.
- You will find your poster number attached to the poster board.
- The poster session will be organized in the **Room SR6** of the South Campus Teaching Hub (140 Chatham Street, Liverpool, L7 7BA).

## Scientific Programme

### Day 1 (Monday, 4<sup>th</sup> July 2022)

Zoom Meeting 1: 92614915928 Passcode: ISPCEM22!

Meeting Link 1: <https://liverpool-ac-uk.zoom.us/j/92614915928?pwd=a3lLeE56UE5UL2hoUDRVODliTE9xZz09>

Zoom Meeting 2: 92364265194 Passcode: ISPCEM22!

Meeting Link 2: <https://liverpool-ac-uk.zoom.us/j/92364265194?pwd=Zmxjd0lKVjZIRmdjeTUrVTBuQmUzdz09>

08:40 – 09:00	Welcome (SCTH LT2, <a href="#">Zoom Meeting 2</a> )	
Plenary Lecture (SCTH LT2, <a href="#">Zoom Meeting 2</a> ) Chair: Xin Tu		
09:00 – 09:45	<b>PL-1</b> Plasma catalysis for nitrogen fixation and CO <sub>2</sub> conversion <b>Hyun-Ha Kim</b> , <i>National Institute of Advanced Industrial Science and Technology (AIST), Japan</i>	
<b>Session 1 (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> <b>Chair: Michail Tsampas</b>		<b>Session 2 (SCTH LT1, <a href="#">Zoom Meeting 1</a>)</b> <b>Chair: Lanbo Di</b>
09:45 – 10:00	<b>O-1</b> Discharge and surface mechanisms in plasma-assisted NH <sub>3</sub> synthesis <b>Gómez-Ramírez Ana</b> , <i>CSIC-Universidad de Sevilla, Spain</i>	<b>O-8</b> High performance TMD/rGO-based HER catalysts using plasma Treatment (V - virtual) <b>Shuyu Zhang</b> , <i>Fudan University, China</i>
10:00 – 10:15	<b>O-2</b> Plasma-catalytic ammonia synthesis under ambient conditions <b>Yaolin Wang</b> , <i>University of Liverpool, UK</i>	<b>O-9</b> Tuning oxide overlayers of CuCoS/CuCoO as efficient bifunctional catalyst for oxygen electrocatalysis (V) <b>Jingxuan Zheng</b> , <i>Tianjin University, China</i>
10:15 – 10:30	<b>O-3</b> Reaction mechanisms and process considerations for plasma-catalytic ammonia synthesis <b>Kevin H. R. Rouwenhorst</b> , <i>University of Twente, The Netherlands</i>	<b>O-10</b> Synthesis of amorphous molybdenum/tungsten sulfide/reduced graphene oxide nanocomposites toward efficient electrocatalytic H <sub>2</sub> production using plasma treatment (V) <b>Dai Zhang</b> , <i>Fudan University, China</i>
10:03 – 11:00	Coffee break	

<b>Keynote Lecture (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> <b>Chair: Changjun Liu</b>	
11:00 – 11:30	<b>KN-1</b> Plasma-enhanced metal-support interaction for engineering robust Ni-based catalysts (V) <b>Xiaoliang Yan</b> , <i>Taiyuan University of Technology, China</i>
<b>Session 3 (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> <b>Chair: Shaojun Xu</b>	
11:30 – 11:45	<b>O-4</b> Characterization of a plasma dielectric barrier discharge reactor packed with Ni/CeO <sub>2</sub> nanostructured catalysts for CO <sub>2</sub> methanation <b>Beatrice Musig</b> , <i>Instituto de Carboquímica ICB-CSIC, Spain</i>
11:45 – 12:00	<b>O-5</b> On the effect of promoters over Ni/CeO <sub>2</sub> catalyst for plasma-catalytic CO <sub>2</sub> methanation <b>Golshid Hasrack</b> , <i>Sorbonne Université, France</i>
12:00 – 12:15	<b>O-6</b> Room temperature plasma-catalytic CO <sub>2</sub> methanation over Ni-Fe/(Mg, Al)O <sub>x</sub> catalysts: A study using response surface methodology <b>Yao Zhang</b> , <i>The University of Manchester, UK</i>
12:15 – 12:30	<b>O-7</b> Plasma catalysis for CO <sub>2</sub> hydrogenation: Unlocking new pathways toward CH <sub>3</sub> OH <b>Roel Michiels</b> , <i>University of Antwerp, Belgium</i>
12:30 – 14:00	<b>Lunch</b>
<b>Session 4 (SCTH LT1, <a href="#">Zoom Meeting 1</a>)</b> <b>Chair: Xiaoliang Yan</b>	
11:30 – 11:45	<b>O-11</b> Highly active and coke resistant Ni/CeZrO <sub>2</sub> catalysts prepared by plasma decomposition for CO methanation (V) <b>Lei Yu</b> , <i>Tianjin University, China</i>
11:45 – 12:00	<b>O-12</b> Formic acid dehydrogenation over activated carbon supported Pd-based catalysts: Insight into the cold plasma treatment (V) <b>Lanbo Di</b> , <i>Dalian University, China</i>
12:00 – 12:15	<b>O-13</b> TiO <sub>2</sub> -supported AuFe plasmonic nanocatalysts activated by O <sub>2</sub> plasma with a high performance for CO oxidation (V) <b>Xiang Li</b> , <i>Yangtze University, China</i>
12:15 – 12:30	<b>O-14</b> Enhanced CO <sub>2</sub> methanation activity over Ni/SiO <sub>2</sub> catalysts by plasma Decomposition (V) <b>Xingwang Wu</b> , <i>Tianjin University, China</i>
<b>Session 5 (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> <b>Chair: Lea Winter</b>	
14:00 – 14:30	<b>KN-2</b> What do we need for catalysts to be used in hybrid non-thermal plasma catalytic systems? <b>Xiaolei Fan</b> , <i>The University of Manchester, UK</i>
14:30 – 14:45	<b>O-15</b> Tuning oxygenates selectivity in plasma-driven conversion of CO <sub>2</sub> and CH <sub>4</sub> (V) <b>Li Wang</b> , <i>Dalian Maritime University, China</i>
14:45 – 15:00	<b>O-16</b> Efficient conversion of CO <sub>2</sub> and CH <sub>4</sub> into value-added compounds through plasma catalysis process in a dielectric barrier discharge reactor (V) <b>Danhua Mei</b> , <i>Nanjing Tech University, China</i>

15:00 – 15:15	<b>O-17</b> Confined atmospheric pressure glow discharge for CO <sub>2</sub> and CH <sub>4</sub> conversion (V) <b>Bart Wanten</b> , <i>University of Antwerp, Belgium</i>
15:15 – 15:30	<b>O-18</b> Modelling of plasma-catalytic dry reforming of CH <sub>4</sub> : How do radicals affect the behaviour of different transition metal catalysts? (V) <b>Loenders Björn</b> , <i>University of Antwerp, Belgium</i>
15:30 – 16:00	<b>Coffee break</b>
<b>Session 6 (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> <b>Chair: Sibudjing Kawi</b>	
16:00 – 16:30	<b>KN-3</b> Oxygenate production from plasma-activated reaction of CO <sub>2</sub> and ethane (V) <b>Lea Winter</b> , <i>Yale University, USA</i>
16:30 – 16:45	<b>O-19</b> Splitting of CO <sub>2</sub> by a nanosecond pulsed dielectric barrier discharge <b>Sepideh Mousazadeh Borghei</b> , <i>Leibniz Institute for Plasma Science and Technology (INP), Germany</i>
16:45 – 17:00	<b>O-20</b> CO <sub>2</sub> capture and conversion by plasma-sorbent system <b>Sirui Li</b> , <i>Eindhoven University of Technology, The Netherlands</i>
17:00 – 17:15	<b>O-21</b> Catalysts implication in the CH <sub>4</sub> -CO <sub>2</sub> conversion under dielectric barrier discharge (DBD) plasma <b>Elodie Fourré</b> , <i>Université de Poitiers, France</i>
17:15 – 17:30	<b>O-22</b> Experimental insights in the development of an oxygen removal process for coke oven gas with non-thermal plasma <b>Tim Nitsche</b> , <i>Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT, Germany</i>
18:30	<b>Dinner</b> (Sapporo Teppanyaki Liverpool, 134 Duke Street, East Village, Liverpool, L1 5AG)

## Day 2 (Tuesday, 5<sup>th</sup> July 2022)

Zoom Meeting 1: 92614915928 Passcode: ISPCEM22!

Meeting Link 1: <https://liverpool-ac-uk.zoom.us/j/92614915928?pwd=a3lLeE56UE5UL2hoUDRVODliTE9xZz09>

Zoom Meeting 2: 92364265194 Passcode: ISPCEM22!

Meeting Link 2: <https://liverpool-ac-uk.zoom.us/j/92364265194?pwd=Zmxjd0lKVjZIRmdjeTUrVTBuQmUzdz09>

<b>Plenary Lecture (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> Chair: Tomohiro Nozaki		
09:00 – 09:45	<b>PL-2</b> Cold plasmas for catalyst preparation: Current status and perspective (V) <b>Changjun Liu</b> , <i>Tianjin University, China</i>	
<b>Session 1 (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> Chair: Heechae Choi		<b>Session 2 (SCTH LT1, <a href="#">Zoom Meeting 1</a>)</b> Chair: Li Wang
09:45 – 10:00	<b>O-23</b> Non-thermal plasma: An efficient technology for regeneration of coked zeolite (V) <b>Catherine Batiot-Dupeyrat</b> , <i>Université de Poitiers, France</i>	<b>O-30</b> Fluidized-bed DBD reactor for reverse water gas shift reaction: Break kinetic and equilibrium limit (V) <b>Xiaozhong Chen</b> , <i>Tokyo Institute of Technology, Japan</i>
10:00 – 10:15	<b>O-24</b> Application of nonthermal plasma for regeneration of deactivated catalysts <b>Richard Cimerman</b> , <i>Comenius University, Slovakia</i>	<b>O-31</b> Plasma-activated perovskite catalysts with Ni-Fe alloy and oxygen vacancies for CO <sub>2</sub> utilization via reverse water-gas shift reaction (V) <b>Lina Liu</b> , <i>Nankai University, China</i>
10:15 – 10:30	<b>O-25</b> Adjacent surface streamer interactions in packed bed dielectric barrier discharges (PBDBD) <b>Zaka-ul-Islam Mujahid</b> , <i>Ruhr University Bochum, Germany</i>	<b>O-32</b> Pulsed CO <sub>2</sub> methanation in plasma-enhanced catalytic reaction (V) <b>Chunyuan Zhan</b> , <i>Tokyo Institute of Technology, Japan</i>
10:30 – 11:00	<b>Coffee break</b>	
<b>Keynote Lecture (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> Chair: Xin Tu		
11:00 – 11:30	<b>KN-4</b> Unravelling mechanisms of plasma catalysis: Reconciling atomistic models and experiments <b>Kristof Bal</b> , <i>University of Antwerp, Belgium</i>	

Session 3 (SCTH LT2, <a href="#">Zoom Meeting 2</a> ) Chair: Zaenab Abd-Allah		Session 4 (SCTH LT1, <a href="#">Zoom Meeting 1</a> ) Chair: Lina Liu	
11:30 – 11:45	<b>O-26</b> Influence of the catalyst coating geometry on conversion and selectivity for plasma-assisted n-butane removal in synthetic air in an SDBD reactor <b>Timothy Oppotsch</b> , Ruhr University Bochum, Germany	<b>O-33</b> Investigation of synergic response on low temperature plasma-catalytic CH <sub>4</sub> partial oxidation for the production of value-added chemicals (V) <b>Yuan Gao</b> , Institute of Electrical Engineering, CAS, China	
11:45 – 12:00	<b>O-27</b> Removal of benzene as a toxic volatile organic compound using non-thermal plasmas: Understanding the influence of humidity on removing solid residue <b>Usman Dahiru</b> , Newcastle University, UK	<b>O34</b> Plasma catalysis for conversion of light alkanes and CO <sub>2</sub> (V) <b>Yanhui Yi</b> , Dalian University of Technology, China	
12:00 – 12:15	<b>O-28</b> Metal-organic frameworks supported catalyst for room-temperature pollution control by non-thermal plasma <b>Shaojun Xu</b> , Cardiff University, UK	<b>O-35</b> A novel plasma reactor for syntheses of hydrogen peroxide as well as Nanoparticles (V) <b>Qiang Chen</b> , Xiamen University, China	
12:15 – 12:30	<b>O-29</b> Impact of nonthermal plasma ionizer on particulates from biomass boiler combustion <b>Zakariah Adu Adejoh</b> , Newcastle University, UK	<b>O-36</b> Synthesis of nickel phosphosulfide by reduction of amorphous Ni <sub>2</sub> P <sub>2</sub> S <sub>6</sub> in hydrogen plasma (V) <b>Ming He</b> , Tianjin University of Science and Technology, China	
12:30 – 14:00	<b>Lunch</b>		
<b>Keynote Lecture (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> Chair: Xiaolei Fan			
14:00 – 14:30	<b>KN-5</b> Plasma catalysis for modular production of hydrogen and ammonia (V) <b>Mahendra Sunkara</b> , University of Louisville, USA		
14:30 – 15:00	<b>KN-6</b> Innovating catalytic technologies using plasma for low-carbon energy solutions <b>Sibudjing Kawi</b> , National University of Singapore, Singapore		
Session 5 (SCTH LT2, <a href="#">Zoom Meeting 2</a> ) Chair: Danhua Mei		Session 6 (SCTH LT1, <a href="#">Zoom Meeting 1</a> ) Chair: Xuming Zhang	
15:00 – 15:15	<b>O-37</b> Enhanced CO <sub>2</sub> conversion by frosted dielectric surface with ZrO <sub>2</sub> coating in a dielectric barrier discharge reactor (V) <b>Wanyan Ding</b> , Tianjin University, China	<b>O-41</b> Enhancement of surface discharge of packed particle in dielectric barrier discharge reactor (V) <b>Min Zhu</b> , Nanjing University of Aeronautics and Astronautics, China	



15:15 – 15:30	<b>O-38</b> Conversion CO <sub>2</sub> into CO-rich gas via the boudouard reaction in a packed-bed dielectric barrier discharge reactor (V) <b>Minjie Sun</b> , <i>Nanjing Tech University, China</i>	<b>O-42</b> Combined high-voltage pulse and radiofrequency excitation for large-volume high-pressure non-thermal plasma generation (V) <b>Dante Filice</b> , <i>McGill University, Canada</i>
15:30 – 15:45	<b>O-39</b> CeO <sub>2</sub> enhanced CO <sub>2</sub> decomposition via frosted dielectric barrier discharge plasma (V) <b>Mengyu Xia</b> , <i>Tianjin University, China</i>	<b>O-43</b> Plasma promoted hierarchical porous carbon-supported Ni single atom catalysts for highly efficient electrocatalytic CO <sub>2</sub> reduction (V) <b>Qiulin Ye</b> , <i>Zhejiang University, China</i>
15:45 – 16:00	<b>O-40</b> Effect of gas composition on CO <sub>2</sub> conversion in a gliding arc Plasmatron <b>Wencong Xu</b> , <i>University of Antwerp, Belgium</i>	<b>O-44</b> Atomic-scale modelling of photoelectrochemical and electrocatalytic reaction of plasma-synthesized nanomaterials <b>Heechae Choi</b> , <i>University of Cologne, Germany</i>
16:00 – 16:15	<b>Coffee break</b>	
16:15 – 17:30	<b>Poster session (In-person Only)</b>	
19:15	<b>Dinner (Bon Pan Liverpool, 45-49 Clayton Ln, Liverpool L1 1QR)</b>	

### Day 3 (Wednesday, 6<sup>th</sup> July 2022)

Zoom Meeting 1: 92614915928 Passcode: ISPCEM22!

Meeting Link 1: <https://liverpool-ac-uk.zoom.us/j/92614915928?pwd=a3lLeE56UE5UL2hoUDRVODliTE9xZz09>

Zoom Meeting 2: 92364265194 Passcode: ISPCEM22!

Meeting Link 2: <https://liverpool-ac-uk.zoom.us/j/92364265194?pwd=Zmxjd0lKVjZIRmdjeTUrVTBuQmUzd09>

<b>Plenary Lecture (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> Chair: Hyun-Ha Kim	
09:00 – 09:45	<b>PL-3</b> Microplasma jet processing in gas/liquid microvessels - rational design, process design, and outlook to fertilizer application (V) <b>Volker Hessel</b> , <i>The University of Adelaide, Australia</i>
<b>Session 1 (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> Chair: Tomohiro Nozaki	
09:45 – 10:00	<b>O-45</b> Reforming of biomass gasification tar model compounds using hybrid plasma-catalysis processes (V) <b>Yunyang Lu</b> , <i>Nanjing Tech University, China</i>
10:00 – 10:15	<b>O-46</b> Investigation on the mechanism difference of plasma catalytic oxidation of methanol between CeO <sub>2</sub> and Mn <sub>2</sub> (V) <b>Guangyi Zhang</b> , <i>South China University of Technology, China</i>
10:15 – 10:30	<b>O-47</b> Electrode erosion during liquid-phase discharge plasma treatment of phenol solution (V) <b>Weiwei Zhang</b> , <i>Nanjing Tech University, China</i>
<b>Session 2 (SCTH LT1, <a href="#">Zoom Meeting 1</a>)</b> Chair: Yaolin Wang	
09:45 – 10:00	<b>O-48</b> The prediction of ammonia synthesis by dielectric barrier discharge using an artificial neural network model (V) <b>Xing Wang</b> , <i>Chongqing University, China</i>
10:00 – 10:15	<b>O-49</b> A paradigm research on plasma parameters analysis by machine learning for plasma-enabled ammonia synthesis (V) <b>Xin Zeng</b> , <i>Institute of Electrical Engineering, CAS, China</i>
10:15 – 10:30	<b>O-50</b> Partial oxidation of n-pentane to syngas and oxygenates in a plasma-catalytic reactor: Performance and mechanism study (V) <b>Xuming Zhang</b> , <i>Zhejiang Sci-Tech University, China</i>
10:30 – 11:00	<b>Coffee break</b>
<b>Session 3 (SCTH LT2, <a href="#">Zoom Meeting 2</a>)</b> Chair: Gómez-Ramírez Ana	
11:00 – 11:30	<b>KN-7</b> Plasma activated electrolyzers for nitrogen fixation (V) <b>Michail Tsampas</b> , <i>Dutch Institute for Fundamental Energy Research (DIFFER), The Netherlands</i>

11:30 – 11:45	<b>O-51</b> Improving the performances and the arc stability in an N <sub>2</sub> -O <sub>2</sub> gliding arc plasma: Selecting the optimum resistance for the discharge <b>Filippo Manaigo</b> , <i>Université de Mons, Belgium</i>
11:45 – 12:00	<b>O-52</b> The effect of photocatalyst coatings on the formation of ozone and nitrogen oxides in non-thermal atmospheric pressure plasma <b>Zaenab Abd-Allah</b> , <i>Manchester Metropolitan University, UK</i>
12:00 – 12:15	<b>O-53</b> Insight into nitrogen fixation kinetics in a pulsed microwave discharge <b>Omid Samadi Bahnamiri</b> , <i>Université de Mons, Belgium</i>
12:15 – 12:30	<b>O-54</b> Nitrogen fixation through MoO <sub>3</sub> -based catalysts embedded in a microwave plasma post-discharge <b>Babak Sadeghi</b> , <i>Université Libre de Bruxelles, Belgium</i>
12:30 – 13:30	<b>Lunch</b>
13:30 – 17:00	<b>Liverpool FC Tour</b> (pick up time and point: 13:30, the bus stop near the Yoko Ono Centre, Oxford Street, Liverpool, L7 3NY)
19:30	<b>Dinner</b> (Adelphi Hotel, Ranelagh Place, Liverpool, L3 5UL)

## Day 4 (Thursday, 7<sup>th</sup> July 2022)

Zoom Meeting 1: 92614915928 Passcode: ISPCEM22!

Meeting Link 1: <https://liverpool-ac-uk.zoom.us/j/92614915928?pwd=a3lLeE56UE5UL2hoUDRVODiTE9xZz09>

Zoom Meeting 2: 92364265194 Passcode: ISPCEM22!

Meeting Link 2: <https://liverpool-ac-uk.zoom.us/j/92364265194?pwd=Zmxjd0lKVjZIRmdjeTUrVTBuQmUzd09>

Session 1 (SCTH LT2, <a href="#">Zoom Meeting 2</a> ) Chair: Oi Lun (Helena) Li	
09:00 – 09:30	<b>KN-8</b> Plasma-assisted fabrication of nanomaterials for energy storage (V) <b>Zheng Bo</b> , <i>Zhejiang University, China</i>
09:30 – 09:45	<b>O-55</b> Methane coupling in nanosecond pulsed plasma discharges: Kinetic modeling to unravel the effect of pressure and temperature on product selectivity <b>Eduardo Morais</b> , <i>University of Antwerp, Belgium</i>
09:45 – 10:00	<b>O-56</b> Electric field-induced oxidative coupling of methane <b>Valeriia Maslova</b> , <i>Université de Poitiers, France</i>
10:00 – 10:15	<b>O-57</b> Selective oxidation of CH <sub>4</sub> to CH <sub>3</sub> OH by plasma catalysis <b>Shangkun Li</b> , <i>University of Antwerp, Belgium</i>
10:15 – 10:45	<b>Coffee break</b>
Session 2 (SCTH LT2, <a href="#">Zoom Meeting 2</a> ) Chair: Kristof Bal	
10:45 – 11:15	<b>KN-9</b> Plasma-engineered bifunctional oxygen cathode catalysts for rechargeable metal-air batteries <b>Oi Lun (Helena) Li</b> , <i>Pusan National University, Republic of Korea</i>
11:15 – 11:30	<b>O-58</b> Plasma-assisted chemical looping scheme for H <sub>2</sub> production <b>Yaoyao Zheng</b> , <i>University of Cambridge, UK</i>

11:30 – 11:45	<b>O-59</b> Study on nanosecond pulsed discharge plasma driven CH <sub>4</sub> /CH <sub>3</sub> OH to C <sub>2</sub> -C <sub>4</sub> alcohols (V) <b>Jiacong Li</b> , <i>Institute of Electrical Engineering, CAS, China</i>
11:45 – 12:00	<b>O-60</b> Upgrading the low temperature water gas shift reaction by integrating plasma with a CuO <sub>x</sub> /CeO <sub>2</sub> catalyst (V) <b>Xiaoqiang Shen</b> , <i>Chongqing University, China</i>
12:00 – 12:15	<b>O-61</b> Ethylene removal by atmospheric pressure honeycomb plasma with Pd/ZSM-5/monolith catalyst (V) <b>Shirjana Saud</b> , <i>Jeju National University, Republic of Korea</i>
12:15 – 12:30	<b>O-62</b> Plasma-catalytic CO <sub>2</sub> hydrogenation to chemicals: Insights into surface reaction <b>Ni Wang</b> , <i>University of Liverpool, UK</i>
12:30 – 14:00	<b>Lunch</b> (packed lunch)

## Poster Session

5 <sup>th</sup> July 2022, Tuesday (16:15 – 17:30, Room SR6, SCTH)	
P1	Hydrogen evolution from biomass by combined ultrasound-plasma treatment <b>Volker Brüser</b> , <i>Leibniz Institute for Plasma Science and Technology (INP), Germany</i>
P2	Plasma catalytic dry reforming of methane: How material properties influence conversion and kinetics – the PlasMaCatDESIGN project <b>Sander Bossier</b> , <i>University of Antwerp, Belgium</i>
P3	Mass spectrometry measurements of plasma catalysis conversion of n-butane at atmospheric pressure <b>Laura Chauvet</b> , <i>Ruhr-University, Germany</i>
P4	Plasma assisted hydrogen peroxide synthesis: Looking at the interface <b>Mery Hernandez</b> , <i>Karlsruhe Institute for Technology, Germany</i>
P5	Synergistic effect of Co/LDH catalyst on plasma-assisted ammonia synthesis <b>Yuxin Zhang</b> , <i>The University of Manchester, UK</i>
P6	Ni-Co/SBA-15 catalysts for non-thermal plasma activated dry reforming of methane to syngas <b>Xinrui Wang</b> , <i>The University of Manchester, UK</i>
P7	Catalyst-free single-step plasma reforming of CH <sub>4</sub> and CO <sub>2</sub> to higher value oxygenates under ambient conditions <b>Yaolin Wang</b> , <i>University of Liverpool, UK</i>
P8	Understanding the pressure dependence of sub-atmospheric microwave air plasma <b>Ashley Hughes</b> , <i>University of Liverpool, UK</i>
P9	Plasma-catalytic CO <sub>2</sub> hydrogenation over Fe-Cu-based perovskite catalysts <b>Yuxiang Cai</b> , <i>University of Liverpool, UK</i>

P10	Enhanced hydrogen production using a two-stage biomass pyrolysis and plasma-catalytic reforming process <b>Weitao Wang</b> , <i>University of Liverpool, UK</i>
P11	Plasma-enhanced CO <sub>2</sub> methanation over Ni-based catalysts <b>Ni Wang</b> , <i>University of Liverpool, UK</i>
P12	Non-equilibrium plasma for hydrogen production <b>Ibrahim Bakoji</b> , <i>University of Salford, UK</i>