

## THE CI'S 40TH INTERNATIONAL SYMPOSIUM HAS FINALLY BEGUN! WELCOME!

### SPOTLIGHT ON... MEET OUR PRESIDENT



The star of our welcome to you, participants of the Symposium, is our current CI President **Philippe Dagaut**, who is joining us for the whole week! Read on to hear his thoughts on the changes the Institute has gone through during his presidency.

*Left: Philippe welcoming the crowd!*

#### **Can you characterize the progress in the development of the CI in numbers, e.g, number of members, sections, etc.?**

The number of CI Members is almost 6000, based on the information received by the Sections. When we celebrated the 50th Anniversary of The Combustion Institute, we had 29 Sections. This year, we celebrate the 70th Anniversary of The Combustion Institute composed of 36 Sections. Since 2004, Adria, Brazil, Chile, Ireland, Saudi Arabia and Singapore Sections were created.

#### **Was this progress affected by COVID-19 ? To what extent?**

It is difficult to answer this question. It seems to me that COVID largely affected the Symposium. The Adelaide Symposium - initially planned for 2020 - moved online and to 2021, while the Vancouver one (2022) was hybrid, and many colleagues were unable or afraid of traveling abroad. Now in 2024, the Milan Symposium is back to normal format pre-COVID. It will be well attended!

#### **During recent years there were changes in the CI journals and *PROCI*. Which change was the most important?**

Journal changes concern both the *Proceedings of The Combustion Institute (PROCI)* and *Combustion and Flame (CNF)*. The publication process is faster with the recent use of paper number replacing page numbering. Also, the possibility to publish open access increased the attractiveness of our journals. The submission rate to both *CNF* and *PROCI*, having high impact-factors, is increasing, demonstrating the importance of our research field. Furthermore, the Editors of *CNF* have noticed a strong increase over the last 2-3 years in the number of publications on the following topics: Detailed Reaction Mechanisms (+100% increase), Rockets and Ramjets (+87%), Detonation (+37%), and Propellants (+135%). In 2024, the largest number of publications in *CNF* concerns ammonia (140 papers) and hydrogen (190 papers), which are viewed as carbon-neutral.

**SPOTLIGHT ON...**  
*MEET OUR LOCAL HOST TEAM!*

As the head of the 40th ISOC's Local Host Team (LHT), we couldn't pass up talking to **Tiziano Faravelli**, head of the CRECK Modeling Group at Politecnico di Milano:

**Can you tell us a bit about your role as the Chair of the LHT, your challenges and strategies?**

I was met with too many challenges to mention them all in an interview; rather, I could write a small encyclopedia. The most difficult one was probably the growth in costs from the bid (four years ago) to today due to inflation. The strategy proved much simpler. I found a fantastic team who worked very hard to make the Symposium a success.

**What event at this Symposium you are most excited about?**

From a technical point of view, the Plenary Lectures. They will be very stimulating. On the other hand, the picnic and gala dinner are my favorite social events. They provide the opportunity to meet friends and colleagues in two beautiful locations that I imagine will be appreciated by everyone.

**Any message to share with the attendees about the congress and the city?**

I am sure the Symposium will be a success, providing a venue to discuss combustion science and forge collaborations. Also, participants will hopefully visit Milano, a beautiful city rich in history, art, and fashion. I wish everyone a pleasant week of science, culture, and, why not, fun.

**Isabella Branca** of the LHT Board took care of many (many, many, many...) aspects of organization. Despite her busy schedule, we were able to ask her a few questions:

**As we kick off the Symposium with the Welcome Reception, what are your reflections on its success?**

We have done our best to create a welcoming atmosphere for all participants. This is the first symposium without COVID or VISA restrictions, and we are thrilled to see so many (1500+!) enthusiastic delegates!

**What was the biggest challenge when organizing the Symposium?**

The biggest challenge was finding a suitable and affordable banquet location that could host about 800 people... We wanted a cozy and inviting location, and the Alfa Romeo Museum turned out to be perfect for our community. Participants will first enjoy a visit to the historic museum, followed by an aperitif and a selection of dishes from Italian cuisine. I am really looking forward to getting attendees' feedback!

**Prof. Faravelli and you have been named 2023 Milano Ambassadors for promoting Milan as the host city for the Symposium. What does this recognition mean to you and how it has impacted your work?**

This was a big surprise! We didn't expect it, and we are very honored. Personally, I am very proud, and the award has motivated me even more. I hope everyone has an amazing Symposium experience!

## SPOTLIGHT ON...

### CI'S EXECUTIVE ADMINISTRATOR

The CI mind behind the organization of the 40th Symposium is Renny Tassari. She joined the CI in 2018, and took part in organizing the 39th Symposium, but as she said, the 40th edition is her first "real" symposium organized from scratch. While she was making sure of the status of tables and chairs in the Silver Room, we bothered her with a couple of questions!

#### **How did the planning and organization of the Milano symposium present unique challenges compared to the Vancouver symposium?**

Certainly, having a fully in-person symposium is a different experience than the hybrid model in Vancouver. While we do not have some of the issues faced by virtual presenters and attendees, with continued technological advances, we still have issues about how to best deliver the material to our members. We are also trying to incorporate many of the typical events that were lost in the virtual and hybrid meetings such as the Members Meeting and various Board Meetings. There aren't enough hours in the day!

#### **What is one thing most people do not realize about orchestrating a symposium that you would like people to know?**

Obviously, it is a lot of work, from scheduling sessions in a logical order, to selecting venues for our large crowds, the symposium only comes together with the hard work of many people, working together to balance the technical and logistical demands work. However, I hope that to those attending, it looks like a well-oiled machine!



*From L to R: Tiziano Faravelli, Isabella Branca, Renny Tassari*

## WELCOME RECEPTION AND AWARDS CEREMONY

*PLOT TWIST - HALF THE AWARDEES ALREADY GOT THEIR PRIZE DURING THE WELCOME RECEPTION AND WILL GET TO RELAX DURING THURSDAY'S BANQUET!*



The Welcome Reception for the 40th Symposium took place yesterday evening at the MiCo Congress Center in Milan. Hopefully, you already collected your gadgets, including the CI 70th Anniversary T-shirt!

Attendees enjoyed glasses of wine (but the bar shut down during the award ceremony - full focus was demanded!) and appetizers as the Symposium officially kicked off. To ensure some Italian-ness, ice cream was served as dessert!

Finally, a stern Program Co-Chair, Bassam Dally, urged all of Monday's presenters to run and upload their presentations if they haven't already done so.

During the event, six young researchers - introduced by a nice speech by Prof. Benedetta Franzelli - were awarded the prestigious **Bernard Lewis Fellowship**:

**Jackson Crane** (Queen's University, Canada), **Anna Doner** (Massachusetts Institute of Technology, United States - sadly, she couldn't make it to the event!), **Tao Li** (Technische Universität Darmstadt, Germany, and Cambridge University, United Kingdom), **Wei Li** (Shanghai Jiao Tong University, China), **Shaorun Lin**, (University of California, Berkeley, United States), and **Luna Pratali Maffei**, (Politecnico di Milano, Italy).

Subsequently, the 2024 **Hiroshi Tsuji Early Career Researcher Award** (co-sponsored by The Combustion Institute and Elsevier) was presented to **Christopher Goldenstein** and **Zhandong Wang**, while **Jacqueline O'Connor** (who unfortunately also could not attend) and **Wenting Sun** were honored as the 2023 recipients.

We congratulate all the awardees and wish them the best in their careers! Read more about those who attended the event in the next pages!



*From L to R: Benedetta Franzelli, the awardees (Tao Li, Wei Li, Shaorun Lin, Luna Pratali Maffei, Jackson Crane), CI President Philippe Dagaut*



*Registrants pick up their badges!*



*Attendees socialize at the Welcome Reception!*

## BERNARD LEWIS FELLOWSHIP AWARDS

YOUNG RESEARCHERS MAKING AN IMPACT IN THE COMBUSTION FIELD - IMPACTFUL RESEARCH?

**We asked this year's Bernard Lewis Fellowship (BLF) awardees what they think their most impactful research has been so far in their early careers:**

**Jackson Crane** (Queen's University, Assistant Professor): "We developed a unique experiment platform where we were able to isolate the kinetic rates from other thermodynamic properties in detonation. We show that the addition of ozone can dramatically change the detonation characteristics by controlling the kinetics rates. This work not only validates a fundamental aspect of detonation, it also adds a tool for researchers to control detonation kinetics."

**Anna Doner** (MIT, Post-Doc): "The most impactful research finding from my PhD work was discovering new pathways connecting cyclic ethers, specifically alkyl-substituted oxetanes, to small ketohydroperoxides, which may contribute to chain branching."

**Tao Li** (TU Darmstadt, Post-Doc): "During my time as a Phd student I studied the combustion of coal and biomass using advanced laser diagnostics, which can serve as a foundation for the investigation of novel fuels, such as metal fuels."

**Wei Li** (SJTU, Assistant Professor): "Probably my advancements in understanding low-carbon fuels combustion chemistry, such as the ammonia self-promoted pyrolysis mechanism, which is triggered by the significantly increased flame temperature under oxygen enrichment. This results in an unexpected widening of the low NO<sub>x</sub>/NH<sub>3</sub> emission window, demonstrating the role of reaction kinetics plays in addressing key problems in low-carbon combustion."

**Shaorun Lin** (UCBerkley, Post-Doc): "I mainly work on smoldering combustion, which is one of the most persistent types of combustion phenomena. Smoldering combustion poses catastrophic risks to natural environments, however it offers promising avenues for syngas production, waste remediation, and pollution control, if well controlled. Therefore, I work to gain a deeper understanding of how smoldering is initiated, developed and extinguished."

**Luna Pratali Maffei** (POLIMI, Assistant Professor): "I think my most impactful work was the lumping tool I developed specifically for rate constants derived from master equation simulations, as an example of the bridge I am trying to develop between fundamental theoretical kinetics and more macroscopic kinetic modeling."

## BERNARD LEWIS FELLOWSHIP AWARDS

YOUNG RESEARCHERS MAKING AN IMPACT IN THE COMBUSTION FIELD - ANY ADVICE?

**Now, it's time the BLF awardees give some advice to young PhD students: How can you make the most of your research efforts?**

**Jackson Crane** (Queen's University, Assistant Professor): "I have three pieces of advice: work as collaborative as possible, your peer collaborators will become life-long friends and connections; not be afraid to ask lots of questions: it is a sign of a great student and scientist; and take care of yourself, balance your personal life and do something that gives you joy besides work, (for me, it is exercising)."

**Anna Doner** (MIT, Post-Doc): "Take opportunities to participate in events where research is shared in a collaborative environment. Learning how your personal research fits into the bigger picture is a great way to spark curiosity and stay motivated. For me, the combustion community and events like the symposium have been an exceptional place to learn how to do research!"

**Tao Li** (TU Darmstadt, Post-Doc): "During my PhD, I switched my research topic from solid fuel combustion to the combustion of hydrogen and ammonia. Even though this was challenging, it also opened new possibilities and broadened my knowledge in the field of combustion research. Therefore, I encourage PhD students to view such changes as opportunities rather than setbacks."

**Wei Li** (SJTU, Assistant Professor): "For me, gaining new ideas from practical needs and literature, frequently discussing the challenges encountered in research with my supervisor and collaborators, and working diligently to solve these problems. Particularly, obtaining valuable insights and diverse perspectives has facilitated resolution of complex scientific problems."

**Shaorun Lin** (UC Berkley, Post-Doc): "I believe the most important advice is to be persistent and resilient, because research can be challenging and sometimes frustrating. It's important to stay persistent and learn from failures. Every setback is a learning opportunity."

**Luna Pratali Maffei** (POLIMI, Assistant Professor): "I would say, don't be afraid and shy to go and ask for help when you are sure you need it - not only from your supervisors, but from any researchers who could assist you. You'll be surprised of how exciting it is to collaborate also with different research environments, and sometimes by the availability of also more established researchers. I had a great experience with many of them!"



## 2024 TSUJI EARLY CAREER AWARD

HOW TO START A SUCCESSFUL RESEARCH CAREER IN COMBUSTION?



CI President Philippe Dagout and Christina Gifford, Journal Publisher, Elsevier, present the Tsuji Award to Zhandong Wang.

On Sunday night, we all witnessed Professor **Zhandong Wang** (USTC) receive the Hiroshi Tsuji Early Career Researcher Award (another one, after the Bernard Lewis Fellowship in 2014 and the Research Excellence Award in 2020!). Congratulations! Afterwards, we stopped him to ask a few questions.

### How do you benefit from innovations in instrumentation in your research?

In combustion kinetics, advanced diagnostics are crucial. My research primarily utilizes synchrotron radiation photoionization mass spectrometry (SR-PIMS) with molecular beam sampling. Since 2018, as a faculty member and VUV beamline scientist at the National Synchrotron Radiation Laboratory, USTC, I have designed an SR-PIMS instrument with excellent mass resolution and detection limit. I also designed a series of laboratory-based reactors, such as a variable pressure jet-stirred reactor for pyrolysis and oxidation study. The high-quality SVUV-PIMS platform allows comprehensive product measurement, revealing new mechanisms. *I enjoy developing self-designed instruments to solve research challenges.*

### Can you give some advice to young researchers aspiring to make a mark in the field of combustion?

I believe collaboration is crucial in scientific research. *Through collaboration, we can fully leverage each other's strengths* to solve complex and challenging problems. I have benefited greatly from these collaborations and am grateful for the support of my collaborators throughout my career.



Unfortunately, Prof. **Jacqueline O'Connor** and Prof. **Christopher Goldenstein** couldn't join us yesterday to receive recognition for their awards in person! However, they were given the opportunity to submit videos to be played during the reception!

On the left is a picture of the message delivered by Prof. Goldenstein.





## 2023 TSUJI EARLY CAREER AWARD

HOW TO START A SUCCESSFUL RESEARCH CAREER IN COMBUSTION?



CI President Philippe Dagout and Christina Gifford, Journal Publisher, Elsevier, present the Tsuji Award to Wenting Sun.

One year removed from the official announcement, Prof. **Wenting Sun** (Georgia Tech) finally collected his well-deserved Hiroshi Tsuji Early Career Researcher Award! This award comes after a series of CI awards in 2011 (Distinguished Paper Award), 2012 (Bernard Lewis Fellowship), and 2018 (Irvin Glassman Young Investigator Award).

At the Welcome Reception's awards ceremony, we asked him how he thinks he's made an impact, and it seems the answer is, with his passion!

### Can you comment on your research about plasma and ozone-assisted combustion and its significance for the energy transition?

The idea of plasma-assisted combustion is that the plasma enhances the combustion process. Actually, plasma is produced by gas discharge basically putting electrons away from molecules and generating electrons and ions. Those electrons are really energetic, when they collide with molecules, they can break them, regardless of the temperature, and it can happen even at room temperature. This can open up reactions' pathways, therefore we can modify the combustion properties, especially at extreme conditions such as very low-temperature or high-speed propulsion. Ammonia, for example, has a very low reactivity and very high NO<sub>x</sub> emissions, but plasma can effectively increase the its reactivity and help reduce NO<sub>x</sub> emission at the same time!

### What kind of legacy do you hope to leave in the combustion field?

Interestingly, when I was a student, at a very early stage of my career, I wanted to be a legacy, to do impactful work. But at this moment, I don't care about this anymore, *I just do what I'm interested in, I enjoy doing research and answering questions, going deep into a problem. I feel the accomplishment of understanding things.*

### What advice would you give to young researchers aspiring to make a mark in the field of combustion?

For young researchers, the most critical is to *survive in the combustion field*. But eventually, they need to follow their heart and *work with something that they are interested in*, otherwise, it is like finishing a product and starting another one, not being able to enjoy your job. But still, the reality is while you are enjoying your work, it has to get you to survive, so you might divide your time like 30% into getting what you need to get funding and the majority of the time enjoying it.

**WELCOME AGAIN TO  
ALL 1500+ OF YOU,  
FROM THE LOCAL HOST  
AND PLANNING  
COMMITTEE CHAIRS!**



*Creek Modeling Group Trying to relax the weekend before the Symposium!*

### NOTE ON THE SYMPOSIUM APP'S SEARCH FUNCTION

Some participants have asked about the "search" feature in the app. For the OPPs, the search works only if you search by session topic. For PPPs, search works by first author name as well as paper title. WiPP searching works with anything (title and name of any of the authors). If you want to search for speakers, go to the "Speakers" section via the main menu. Sorry if this caused any confusion!

### MONDAY'S HIGHLIGHTS

**2:20 pm** First-ever Poster Paper Presentations (PPP) on the second floor (hanging around the Silver Room!) Make sure to check them out.

**7 pm** Early Career Research Mixer at Trifoglio Building at Politecnico di Milano! Account for about 30 minutes of commute by metro (M5+M2). Don't worry about getting back to your hotels late, Milan public transport runs late and works very well!

**P.S. STAY HYDRATED! IT'S #AlwaysHot HERE**

*What is the Symposium Tribune? It's a daily bulletin that will keep you updated on all the key highlights and events happening at the Symposium, including interesting scientific talks and interviews to speakers, organizers, awardees. You will also find opinions from participants, and insights into social events in case you can't make it!*

*Contributors: Luna Pratali Maffei (POLIMI), Fabiola Citrangolo Destro (LL-CNRS), Lauren Creadore (CUNY), Mario Di Taranto (SINTEF), Ali Elkhazraji (KAUST), Federica Ferraro (TU-Braunschweig), Alexander Konnov (Lund University), Yuyang Li (SJTU), Zhuyin Ren (Tsinghua University), Maria Virginia Manna (STEMS-CNR), Max Schneider (TU Darmstadt), Jungho Sohn (KAIST), Stephen Tse (Rutgers), Augustin Valera-Medina (Cardiff), Draven Marino (The Combustion Institute), Tiziano Faravelli (POLIMI)*

**Feedback is always welcome, and can be submitted via Telegram: <https://t.me/CombustionSymposium2024/2>**