

## The future of chemistry: a young chemist's perspective

As a young chemist and recent PhD graduate, I am constantly looking to the future to decide the next steps in my chosen profession. Fifty years from now, I will presumably be at the end of my career and it is hard to imagine what the world will be like. Technology advances much faster than it used to, and it has had a great impact on the chemical enterprise. However, we still have a long way to go to solve one of the most pressing issues; it is impossible to think of the next fifty years of our field without thinking of the impacts of climate change. Our generation, and the generations that follow, will have to adjust to an ever-changing world and, if the predictions of 2030 are accurate, we must act now. Climate change is a very large global with many facets to address; instead I will focus on two issues that I hope we in the chemistry community can address.

Firstly, a genuine concern of mine is the pollution of the oceans from plastic waste; banning plastic straws is one small step in a positive direction, but the problem is much larger than that. The discovery of a pregnant whale with 50 pounds of plastic in her stomach is evidence of how insidious the spread of plastic waste has been in our modern world. While traveling in Belize for a science course, I witnessed first-hand a small deserted island with the shorelines covered in plastic waste that had been washing up for decades. I am encouraged by the research that demonstrates microbes and mealworms can consume plastic, but we must strive for a more sustainable solution as this problem continues to grow.

Second, at a more human level, we must strive to improve the inclusion and diversity of the chemical field. Although women are more visible than in previous generations, men still hold many of the high-level leadership positions at universities and major companies. Moreover, the field is still predominantly white; people of color and people from different socio-economic backgrounds often are not afforded the same privileges when it comes to professional development. It is important that we use our resources to support not only the next-generation of scientists, but the current generation of scientists who are not given equal opportunities.

In order to combat these issues affecting our field and our world, it will require collaboration from all countries and cultures. As the next generation of scientists, representing over twenty-five countries, I believe the International Younger Chemists Network (IYCN) has a role to play. When we give presentations, we always say "*the future of chemistry is global*", and that is true now more than ever. For me, young scientist's groups like IYCN not only elevated my career but introduced

Join us all the week for a dedicated Young Symposia Programme\* and for our **symposium "The International Younger Chemists Network (IYCN): Shaping the future worldwide"** on Tuesday July 9th from 08:30-12:30 (Young Scientists Programme, Symposium 7.6) during the 47<sup>th</sup> IUPAC World Chemistry Congress. IYCN membership is open to any chemist under the age of 35 or someone who is five years from their terminal degree or postdoctoral appointment.

For more information, you can reach us at [IYCN@IUPAC.org](mailto:IYCN@IUPAC.org). If you want to follow what we are doing, please visit [iycnglobal.com](http://iycnglobal.com), like us on Facebook (IYCN.global), and on Twitter (@IntlYoungerChem).

\* [www.iupac2019.org/young-scientists-programme](http://www.iupac2019.org/young-scientists-programme)

me to a community of scientists who are paving the way forward. I believe every young chemist needs this kind of support and IYCN aims to be that support on a global scale. We are seeing ourselves in young scientists like 29-year-old Katie Bouman who championed the first ever image of a black hole as a shining example of what we can contribute. In spite of the dire situations facing our world, I have hope for the future.

In addition to my perspective, I asked the Chair of IYCN, the Chair of the European Younger Chemists' Network (EYCN), the Vice-President of the French Young Chemists Network (RJ-SCF) and others IYCN Board Members to share their views on the future of chemistry. The views expressed in the next page are entirely their own and not representative of their organization.

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## Testimonials from international Young Chemists

*"Chemistry need to engage quickly in sustainable development to answer societal and environmental daily issues. One way will be to increase artificial intelligence, machine learning and robotization in each step of the process."*



**Alexandre HERVÉ, PhD**  
Vice-President of the French Chemical Society (SCF)  
Vice-President of the French Young Chemists Network (RJ-SCF)  
Post-doctoral researcher at Sorbonne University, Paris (France)



**Evijola LLABANI, PhD**  
Chair of the IYCN  
PhD student at the University of Illinois, Urbana (USA)

*"Fifty years from now, I hope chemistry will have actionable solutions to today's global challenges despite the obstacles, and continue to be at the forefront of scientific progress in pursuit of improving our daily lives. Young chemists are leading such effort: give them the support they need, and their chemistry will deliver!"*

*"For many, energy or climate change would see the biggest advances, but I am more excited on many unanswered questions of the human body. In the next few years, I would wait new advances on the intersection between new materials (nano-materials... maybe) in the human body, such as the reconstruction of spinal medulla seen in the media at the end of last year."*



**Antonio M. RODRÍGUEZ GARCÍA, PhD**  
Chair of the European Young Chemists' Network (EYCN)  
Post-doctoral researcher at the Universidad de Castilla-La Mancha (Spain)



**Willis Collins AKEYO MUGANDA, MSc**  
Finance Chair of the IYCN  
PhD student at the University of Siegen, Siegen (Germany)

*"The future of this universe is in the hands of young chemists, whose brilliance and motivation will be needed to revitalise innovation with aim of fostering sustainability and digitalisation."*

*"It has been a wonderful experience to be a part of IYCN with global perspective of networking beyond our boundaries or labs especially among younger chemists. As Louis Pasteur once said: "Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world."*



**Hmunshel JASHA, PhD**  
IYCN Conference Presence Sub-Committee  
Senior technical staff, Sophisticated Analytical Instrument Facility, North Eastern Hill University, Shillong (India)



**Gabriela Desiree TORMET-GONZÁLEZ, MSc**  
Webmaster of the International Younger Chemists Network (IYCN)  
PhD candidate, University of Campinas (Brazil)

*"For the future of chemistry, I am sure we will see a difference in the way chemistry is taught. We will have to teach to a new generation that has grown up with internet and social media, using technologies such as machine learning and virtual reality. It will be easier to understand abstract concepts like molecular orbitals or mechanisms."*