

The PARTY Approach: How Friendship Transcended Borders for Science

by Yvonne S. L. Choo, Fun Man Fung, and Juliana L. Vidal

Just as organic reactions necessitate the interaction of different molecules, groundbreaking discoveries in chemistry burgeon from a diverse mix of minds working in close collaboration. While the COVID-19 pandemic presented unforeseen challenges by restricting physical interaction and international research, technology stepped in as a game-changer. Digital connections transcended geographical borders, fostered friendships and ignited a spirit of cooperation like never before. This article delves into the PARTY Approach, where (P)assion, (A)spiration, (R)elationship, (T)eamwork and (Y)outh come into play. Here, we explore the stories behind a remarkable trio brought together by their shared passion for chemistry, sustainability and education. Through their conversation, we will discover how friendships blossomed across borders, fuelled by a collective drive to make a positive impact on the world.

The PARTY Approach is a coined abbreviation for (P)assion, (A)spiration, (R)elationship, (T)eamwork and (Y)outh. In this narrative interview piece, we delve into a meaningful conversation with three unique individuals who embody these principles:

Yvonne Choo (YC) is an Assistant Professor based in the School of Energy and Chemical Engineering, Xiamen University Malaysia.

Fun Man Fung (FM) is an Instructor at the Department of Chemistry, Faculty of Science, National University of Singapore, and Academic Affiliate at the NUS Centre for Teaching, Learning and Technology.

Juliana Vidal (JV) is a Program Manager, Higher Education at Beyond Benign.

Tell us a little bit more about yourself and what you do on a day-to-day basis?

YC: I am an organic/polymer chemist by training. My research revolves around the design and development of new shape-memory polymers a.k.a. 'Smart Materials' for use in, but not limited to, 4D-Printing and energy applications. In addition to making polymers 'smart', I strive to put my creativity and passion for chemistry to good use—in education. I like to help students learn and better visualise complex chemistry/biochemistry



concepts through the use of toys, like LEGO [1]! On working days, I juggle the responsibilities of a full time academic—I teach, do research, handle administrative duties, supervise postgraduate students, *etc.*

FM: At the National University of Singapore (NUS), I work on educating future-ready chemists via evidence-based mentoring and research. My current research interest lies at the intersection of learning sciences and technology focusing on chemical education. My work explores the development of digital technology to enhance learning experiences [2], supporting students in overcoming appropriate obstacles in their learning and strengthening continuous learning for professionals. My research is informed by my classroom and laboratory teachings. In short, I think about how to help learners learn better daily.

JV: At Beyond Benign, we work to support and empower the chemistry community to achieve sustainability at the molecular level through green chemistry. My main focus is on the Green Chemistry Commitment program [3], which aims to promote the inclusion of green chemistry in the curriculum of higher education institutions. I work with a lot of inspiring people every day, and I'm so thankful for that! Previously, my Ph.D. and then post-doctoral research was based on renewable materials and greener processes to reduce our impact on human health and the environment.

What was the backstory behind your acquaintance with each other?

YC: I believe it was during the COVID-19 pandemic that I read a news article on X (then Twitter) about the release of the 2020 CAS Future Leaders [4]. JV and FM

were from the same cohort. Did the both of you meet in person back in 2020?

FM: Unfortunately, 2020 was not meant to be. The 2020 CAS Future Leaders was supposed to be an in-person week-long program but it was unfortunately being conducted online with regular training and a revised schedule. We met online but in the absence of a full cohort due to different time zones. It wasn't until three years later, at ACS Spring Meeting 2023 at Indianapolis, that I met JV in person!

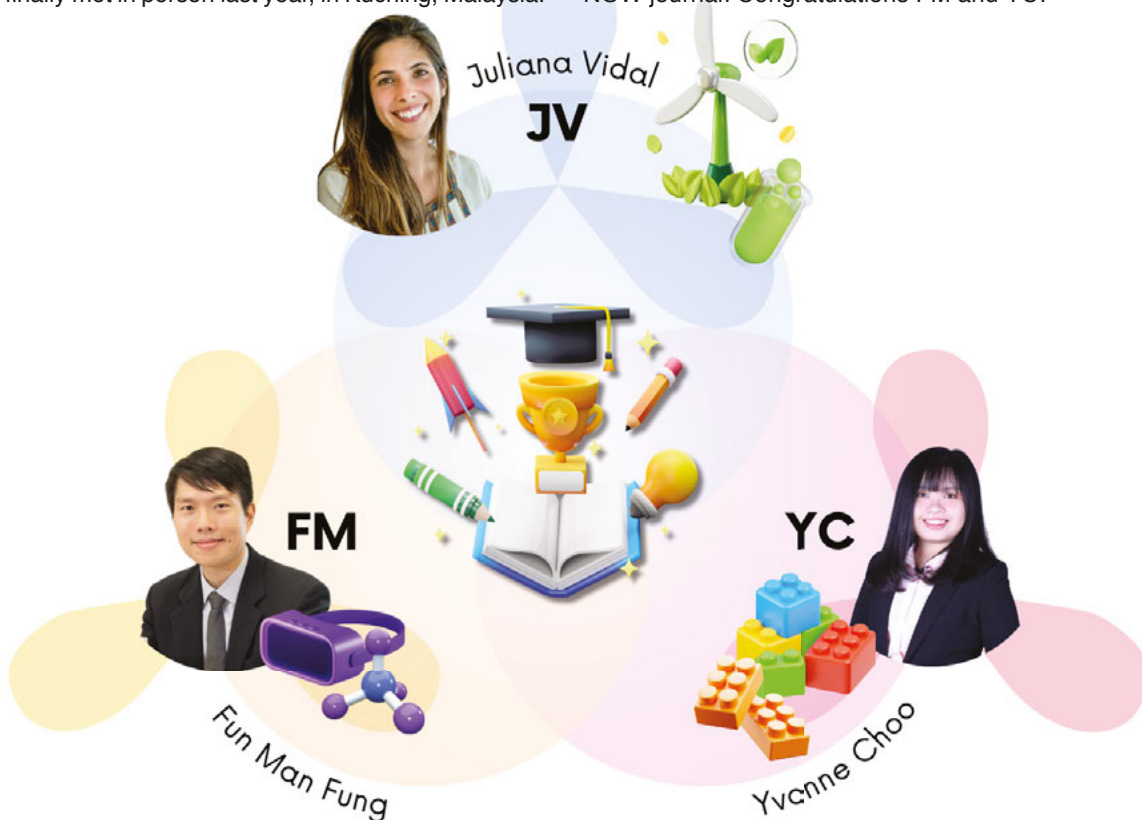
YC: Yes, it was definitely a challenging period for us all, but I am so glad that X kept us connected somehow [5,6]. I followed you (FM) on X at the start of the pandemic, where teaching and learning were forced to be conducted online. It was refreshing to find someone so passionate about chemistry education amidst the situation. We were also involved in the International Younger Chemists Network (IYCN) [7], so we met on several of the online meetings, as well as ones involving the International Union of Pure and Applied Chemistry (IUPAC)'s Committee on Chemistry Education (CCE). We finally met in person last year, in Kuching, Malaysia.

FM: We did! It was for the 9th Network of Inter-Asian Chemistry Educators (9NICE) Conference 2023 [8]. JV and YC, the both of you worked on an IUPAC-IYCN project together. How did the both of you meet?

JV: No, we have not met in person! We have worked together since 2022 in the Global Conversation on Sustainability (GCS) project (IUPAC project 2021-034-2-041) [9]. This project was co-created by IUPAC and IYCN to disseminate the adoption and practices of more sustainable discussions and actions. This year, both of us serve on the Committee on Chemistry Research Applied to World Needs (CHEMRAWN) of IUPAC [10].

YC: I remember we were also connected on X way back then, JV. It's interesting as I can figuratively see our 'orbitals' overlap in terms of our friendships, shared interests and involvements.

JV: And now the two of you are Thieme Chemistry Journals Award recipients [11] where I am working as an Associate Editor for the Sustainability & Circularity NOW journal! Congratulations FM and YC!



Yvonne Choo (YC), Fun Man Fung (FM) and Juliana Vidal (JV), showcasing their individual areas of interest and overlapping regions.

The PARTY Approach:

What were the unique journeys that led each of you to engage with IUPAC?

YC: My journey started back in 2011, sometime in August. That year, IUPAC celebrated the International Year of Chemistry. I participated and won first place in the IUPAC Polymer Video and Essay Competition on the topic of “A World without Polymers?” and was then given the chance to attend the 43rd IUPAC World Chemistry Congress in San Juan, Puerto Rico. I talked about what inspired the creation of my video and held a screening to those in attendance [12].

FM: For me, it was in 2013 that I attended my first International Chemistry Olympiad (IChO) in Moscow, Russia Federation [13,14] where I became aware that IUPAC provided sponsorship to this global competition for the youths. In 2017 when the 49th IChO was held in Nakthon Pathom, Thailand, then, as an elected Steering Committee member, I met and hosted Jung-Il Jin, then IUPAC President, where we had a long conversation and I learned about IUPAC CCE helmed by Jan Apotheker. At the time, Singapore was not part of

the IUPAC family yet, but in 2019, when Singapore made an application to join IUPAC, I was in Paris, France, as a volunteer mentor guide for the IChO, upon invitation from the Inspector General of French Ministry of Education and Youth, and President of the 51st IChO organizing Committee, so I was invited to join the centennial celebration [15]! When IUPAC Council and country delegations voted Singapore in, I was nominated to be the National Representative of Singapore National Institute of Chemistry (SNIC) to serve on CCE. I was just lucky to be at the right place at the right time!

YC: It's amazing how the stars aligned! In 2019, IUPAC also celebrated the International Year of Periodic Table, and both of us were awarded an element each in the Periodic Table of Younger Chemists [16]! I was Bohrium, and you, FM, were...Fluorine?

FM: Yes, I represented Fluorine. Altogether, 118 younger chemists from diverse backgrounds around the world who embodied the mission and core values of IUPAC were showcased.



YC, FM and JV's IUPAC journeys represented on a timeline (2011 – 2025).

How Friendship Transcended Borders for Science

YC: How special! You got to witness the meaningful celebration first-hand! Although I was not physically present in Paris, the bidding slides I prepared for IUPAC 2025 were presented by delegates from the Malaysian Institute of Chemistry (IKM) there at IUPAC 2019. Malaysia won the bid! It wasn't until exactly 10 years after my first IUPAC congress in 2011 that I got to attend another IUPAC congress in 2021, virtually, thanks to the pandemic [17]. For me, what made it even more memorable is that I was nominated by IKM to serve IUPAC as a National Representative of CHEMRAWN, a young observer in the Polymer Division and a Malaysian Delegate in the IYCN. My IUPAC journey came full circle! What about you, JV?

JV: My first encounter with IUPAC was in 2019, helping to co-organize the Global Women's Breakfast (GWB) in the institution where I was getting my Ph.D., Memorial University of Newfoundland (MUN), in Canada. My Ph.D. supervisor, Francesca Kerton, was already super involved with IUPAC then and her support was fundamental to the event's success. I was involved with the GWB organization until I completed my Ph.D. in 2021. In 2024, I was thrilled to support the organization of a GWB at Beyond Benign, in collaboration with The U.S. National Committee for the International Union for Pure and Applied Chemistry (USNC/IUPAC) [18-20]. I became directly involved with IUPAC in 2022, and we (YC and JV) worked together on the GCS project mentioned earlier. This year we serve CHEMRAWN together, too! I am a National Representative, while you (YC), are the Associate Member. I remember you were physically there at The Hague, Netherlands last year when that was announced? [21]

YC: Oh yes! I remember seeing you on screen, attending our hybrid CHEMRAWN meeting online, during IUPAC 2023. Hopefully, in 2025, we can all reunite, and I can finally meet you (JV) in person at IUPAC 2025, to be held in Kuala Lumpur, Malaysia! [22] Looking forward to welcoming the both of you!

JV: We look forward to being there too! Since we are on the topic of IUPAC, there is the Thieme-IUPAC Prize coming up this year by the Thieme Group in collaboration with IUPAC and the Editors of SYNTHESIS, SYNLETT, SYNFACTS, and Science of Synthesis. The award of €5,000 is presented every two years on the occasion of the IUPAC–International Conference on Organic Synthesis (IUPAC–ICOS) [23].

FM: That is certainly a wonderful opportunity!

Can you shed more light on projects related to chemistry, sustainability, or education with global reach that you've been involved in, either individually or in partnership with others?

JV: Since my undergraduate studies, I have been interested in the communication aspect of science. This is how I ended up as the Director of Marketing and Communications of the Network of Early-Career Sustainable Scientists and Engineers (NESSE), which led to my initial work at Beyond Benign as their Communications Intern. At Beyond Benign, I now work full-time to empower the community to achieve a more sustainable future through green chemistry education. I currently manage the Green Chemistry Commitment (GCC) program, focused on the higher education space. I have also been in the Governance Task Force of the Chemical Institute of Canada (CIC) and was involved with the IYCN helping to translate chemistry experiments from English to Portuguese used in outreach [24]. Currently, besides the GCS and CHEMRAWN, I am also involved with the Chemicals & Waste Youth Platform of the Major Group for Children and Youth at UNEP. Regarding my impact on the community, I just trust the process and try to make meaningful connections along the way of disseminating green chemistry at any chance I get! In this regard, I see education as a catalyst for the sustainable future we need and want—and I feel inspired by people like you, YC and FM, every day!

FM: I do my best to support whenever people feel that I can be helpful. If there's an endeavour people reached out to me that aligns with my values, I am always open to considering it. For instance, I recently participated in the event DiscovHER 2024, organized by the Science Centre Singapore [25]. This event promotes STEM for Societal Change, where attendees engaged in various immersive experiences, understanding sustainability via life cycle assessment, and getting their hands on crafting decorative pottery from recycled polymers. The Science Centre Singapore is an amazing place to learn how science is integrated into our daily lives. I enjoy collaborating with the people there as they are passionate about how science can transform lives and the future of Singapore. I find that via experiential learning, it sticks more! What it means is, education that activates more senses of the learner lasts longer [26]. I vividly remember during the pandemic, I was involved as a Task Group Member of the IUPAC Young Ambassadors for Chemistry in Cape Town (IUPAC project 2021-031-2-050). We supported organizing a science festival in

The PARTY Approach:

the form of an Open Day for the general public. The main objective is to initiate a lasting project at the Cape Town Science Centre on the relevance of chemistry to the grand challenges of sustainability [27,28].

YC: I am a science communication enthusiast and have been actively involved in various public engagement and outreach events since 2010. Back in my undergraduate days, I was invited to speak at several Malaysian Chemistry Carnival (K2M) aimed to promote public awareness and appreciation of Chemistry. I got more involved in scientific dissemination during my Ph.D. through events like Soapbox Science [29]—I literally stood on a soapbox in the middle of Grey Street, Newcastle, to have an informal chat about polymers and my research, with anyone who would come by my soapbox. The Big Ideas Event where I was given the chance to share my 'Big Ideas' to 10-11 year-olds with the help of a children's book and STEM for BRITAIN is where I got to talk to policymakers at the Houses of Parliament about my Ph.D. research on membranes for artificial photosynthesis [30]. After my Ph.D., I started to engage myself more actively with learned societies which have broadened my reach and network, allowing me to contribute to different projects involving the wider international community. That's how our 'orbitals' began overlapping!

What are some of the impediments you have encountered in the process, and what key takeaways have you garnered from them?

YC: Every journey has its set of challenges; especially when you are embarking on new or less travelled paths, you are bound to be faced with disbelievers and naysayers. I could still remember bystanders telling me I was wasting my precious research time and energy on outreach activities during my Ph.D. No doubt, outreach activities do take up a portion of my time that could have been used for research; however, outreach activities bring me joy and a sense of satisfaction as I am able to share my passion for chemistry and education in the hope of inspiring them. Had I let their thoughts and perceptions deter me from doing what I find value in, I would not have reached where I am today. We all have different journeys and life goals, trust your instincts and try not to be swayed unnecessarily. Most importantly, surround yourself with like-minded people who resonate well with you. Have them in your support system—in your circle of close friends or even collaborators! So glad I have both FM and JV in mine!

JV: I agree with you—also, resistance to change is another challenge that we see at Beyond Benign

through our Green Chemistry Commitment program, since higher education institutions can be resistant to including green chemistry in the chemistry curriculum and adapting to the change that is so desperately needed on our planet right now. This can be translated into different projects and aspects of our lives.

FM: This resonates so much with me. It is sometimes challenging to convince others that our group's intentions and approaches are in line with the broad strokes. I learned to realize that individuals have different interests, and sometimes, these interests change with situations, which can divert the project in either way. In addition to having the right team and the right timing, I find that great projects eventually succeed because the stars are aligned, which is incredibly fortunate. There are many moving blocks, and we may not be able to control all these variables.

What advice would you give to people looking to get involved more actively (e.g. volunteering/learned societies, etc.)?

JV: I am thankful for being able to work with so many people who inspire me, and I found my heroes by going outside of my very small bubble. By volunteering yourself to do things outside your comfort zone, you can grow a different set of skills and get to know different people, with whom you can collaborate on diverse projects associated (or not) with your primary field/research. I have problems saying 'no' to things, which can be something very overwhelming (and I totally do not recommend it), but it is something that also took me into different projects that I had no idea I could take part in, in which I learned a lot (personally and professionally) and made new friends!

FM: My journey was off the beaten path. I have been a volunteer for a long time, even at sporting events. If volunteering is in your DNA, I would suggest having some level of self-awareness—knowing your strengths and lesser strengths. In some groups, your strengths might not be needed at that point as there are already people who can contribute better. If you are a versatile person with various skills, good on you! Then you can offer a hand based on your expertise. Do the right thing in the right way.

YC: You got to be willing to try because very often, it is when we put ourselves forward and take that first step that we will realize whether a certain activity or involvement is suitable for us. In the process, you will

How Friendship Transcended Borders for Science

gain exposure, pick up different skill sets, expand your network and learn new things! The term ‘active involvement’ can be very subjective as the level of activeness varies between individuals; find a pace and a level of involvement that best suits your current journey. Lend a helping hand whenever possible.

Conclusions

Through the PARTY Approach, the stories shared by these individuals reflected how their shared (P)assions, mutual (A)spirations, meaningful (R)elationships, collaborative (T)eamwork and the fresh perspectives gained from working with (Y)ouths can make a difference and most certainly pave the way for innovative solutions to solve some of the world’s most pressing challenges in the field of Chemistry, Sustainability and Education!

We hereby invite you to use this approach or create your own to promote systemic change regardless of the field you are in. So, let’s PARTY! 

Disclaimer: The views and opinions expressed in this article are solely those of the authors and do not represent the views of this journal and the organizations they work in.

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