Statement of teaching philosophy and experience

Teaching Interests

I am confident teaching all flavors of physical chemistry and general chemistry courses as well as organic electronics, polymer/materials chemistry at both graduate and undergraduate level. I would love to develop and teach a course focused on the Python programming language and its applications in computational chemistry; this could be either tailored towards graduate students or towards Master/Bachelor students as an introductory programming course with general scope. I also plan to cover version control (git) and data visualization.

Teaching Philosophy

My teaching philosophy borrows from my passion for storytelling, as well as from my personal investment towards diversity, equity and inclusion. I strive to develop a personal connection with students and create a welcoming learning space; this has been demonstrated to be an important factor for student retention, especially in the STEM disciplines (Seymour and Hewitt, 1997; Pascarella and Terenzini, 1977). I seek to apply the Universal Design for Learning (UDL) principles by providing multiple sources of information the students can engage with. I always look for ways to engage my students and make the concepts I am explaining relatable to them, using unconventional media (chemistry related memes or videos) or borrowing from my own experience (showing photos I took at Mendeleev's periodic table museum).

When teaching computational chemistry laboratories, I am especially careful to make sure that students that are less familiar with the tools used in the computational lab (i.e. the terminal, Linux) are not left behind. I have found that interactive notebook-style environments (i.e. Jupyter) are particularly well suited to ease the learning curve and allow each student to follow their own pace. This approach has proven successful both with the students I mentored individually as well as during the workshop I organized and taught at Northwestern.

I have noticed that students often see physical and theoretical chemistry as difficult and intimidating subjects. To counter this, I have made my laboratory classes approachable and fun. For example, at the University of Bordeaux I engaged the students of the Master in Chemistry who were taking their first computational chemistry laboratory by showing them the NanoCar Race (http://nanocar-race.cnrs.fr/indexEnglish.php) and taught them how to build and simulate a 'molecular car' using molecular dynamics simulations.

Teaching experience and qualifications

Over my PhD and postdoctoral career, I have actively sought multiple occasions to teach and mentor students for laboratory classes and projects. I have acquired experience in teaching a wide range of physical chemistry laboratory classes, including kinetics and thermodynamics, quantum chemistry, molecular dynamics, scientific programming in Italian, English and French. At Northwestern University I gave guest General Chemistry lectures to ~200 first year students; I also co-organized and taught a 2-day workshop on data analysis of molecular simulations based around the python package MDAnalysis that saw participants from across the US. The workshop material is freely available on GitHub (https://www.mdanalysis.org/WorkshopHackathon2018/).

While at Northwestern, I also enrolled in the training offered by the NSF-funded Center for the Integration of Research, Teaching and Learning, earning the CIRTL Associate Certification. The program entails coursework, lectures on effective teaching practices and evidence-based teaching, as well as pairing with a Faculty member. Shadowing a teaching faculty member has been an enlightening experience and inspired me to incorporate new teaching strategies such as problem-based learning and flipped classroom in my future courses.

My outreach experience has allowed me to further hone my communication skills. I have given science talks to both teenagers and adults on school visits science cafés; I am looking forward to giving a talk on eumelanin at the next Pint of Science event in Liverpool, as well as continuing my engagement with SkypeAScientist, an association connecting teachers and scientists who can present their work to pupils from any grade.

Mentoring philosophy and experience

Over the course of my career I have supervised and mentored several graduate and undergraduate students, acting as an informal advisor. I espouse the student-supervisor alignment model (Gurr 2001), so I dynamically align my supervisory style to the student level of competence towards developing the student's autonomy. I include the student in my enthusiasm and strive to inspire them as we develop ideas together.

I am currently co-supervising a PhD student in my host group who is working on a project stemming from my research line. I have been careful to let them develop their own perspective on the topic without imposing my own; at the same time, I made sure they felt confident to ask for help whenever they needed it.

Working with undergraduate students has been a particularly rewarding experience, as it is often their first contact with a research environment. I thoroughly enjoyed passing on the programming skills and research practices they will use throughout their PhD or future work, and seeing their confidence grow day by day.

As a group leader, I plan to develop a 'group handbook' that will include a code of conduct, a mentoring statement, as well as assessment tools for students that will be able to provide feedback over the supervision (https://www.ithinkwell.com.au/for-research-supervisors).

Commitment to Diversity, Equity and Inclusion

The belief that everyone belongs in STEM is a core part of my identity as a scientist. I am dedicated to creating an inclusive and explicitly centralizing learning environment, where students from all backgrounds can feel comfortable.

I am actively pushing for a more open, welcoming and equitable access to open-source communities: In occasion of the free MDAnalysis workshop I co-organized in 2018, I fundraised and implemented a scholarship offering free accommodation during the event to participants from underrepresented minorities. In Liverpool, I serve in the departmental Diversity, Equity and Inclusion group and I cofunded the local chapter of a global association for women in science (500womenscientists).

As a future faculty member, I look forward to fostering an inclusive and diverse research group and I aspire to continue being a STEM role model through my online presence and community building events. I will actively work to increase the participation and retention of underrepresented minorities in academia and STEM in several ways:

- I will take an active role in the committees and activities focused on diversity, equity and inclusion, volunteering as a panel member or mentor;
- I will be an advocate for affirmative action and welcome students and postdocs from underrepresented minorities in my group;
- I will be a mentor and sponsor for students and trainees coming from underserved communities, working to increase their retention and chances of success in academia;
- I will have an open door policy and encourage students to discuss issues beyond coursework that might affect their University experience.

My office will be a safe space for students from any gender, sexual orientation, ethnicity, immigration status, religion or socioeconomic background.