

A Focus Honoring Helmut Schwarz's Election to the National Academy of Sciences

An Appreciation for and an Interview with Professor Helmut Schwarz

It is a pleasure to introduce a special focus of the *Journal of the American Society for Mass Spectrometry* to celebrate the accomplishments of Prof. Helmut Schwarz on the occasion of his election as a Foreign Associate of the US National Academy of Sciences, USA in 2018. This issue contains a total of 20 papers around the theme of *Gas-Phase Ion Chemistry*. The topics of the articles include: theory of ion chemistry; reactions of atomic metal cations; palladium, platinum and gold chemistry; metal oxides; cluster chemistry, fullerenes; polymers, biopolymers and supramolecular chemistry; analytical chemistry; droplet effects. We thank all the authors and reviewers for helping this issue come to fruition. In order for readers to learn more about Helmut, we first give our impressions of him and then ask him some questions.

HELMUT SCHWARZ—there is hardly a name found more often than this in the mass spectrometry and gas-phase chemistry literature. Be it the activation of methane or gas-phase models for catalysis in general, be it relativistic effects or non-ergodic behavior, spin states or kinetic isotope effects, metal clusters or elusive molecules, remote functionalization or the encapsulation of atoms in fullerenes, Helmut Schwarz has not only treated all of these topics and many more but also defined our current knowledge and understanding like no one before. Together with his group, he has employed the most sophisticated (and expensive) mass spectrometers as well as the most refined theoretical calculations to unravel the deepest mysteries of molecules and pierce into the most intricate reaction mechanisms. “Who is this man?”, asks the dazzled reader, “who captures holy grails like common souvenirs, who publishes more papers than other people are able to read during their whole life, and who commands a prose more elaborate and complex than that of Thomas Mann?”

He or she will soon find out when visiting any high-profile conference on mass spectrometry. There, in one of the front rows, will sit this distinguished-looking gentleman, whose countenance may instantaneously change from rigorous shrewdness to parental benevolence. The speakers tremble in expectation of his inevitable questions and comments, which either annihilate year-long efforts of research or open new perspectives completely unthought of. And then, during one of the plenary lectures, the full vigor and brilliancy of his



personality will burst out. The eloquence of his intellect, the power and energy of his speech, and, most of all, its startling rapidity, first amaze the audience, then overwhelm them, and, finally, leave them back aware and ashamed of their own relative insignificance. Awestruck, they ask “is he not really superhuman”?

Those who, like the three undersigned, have the privilege of knowing Helmut more intimately will clearly answer: yes, and even more so! Helmut not only is an absolutely outstanding scientist, an unbelievably prolific writer, and a truly exceptional orator but has also been one of the most influential and successful champions in German and international science politics, having served as the Vice-President of the German Research Foundation and President of the Alexander von Humboldt Foundation. Still, his interest in and commitment for science only make up for a part of Helmut's personality. Being, unlike ordinary mortals, relieved from the need of sleep, he also spends his time in appreciating and enjoying all the fine facets of life, from good food and wine to literature and classical music, with his taste for and knowledge in the arts rivaling his scientific ingenuity. Together, his vivacity, alertness, and intellectual splendor give rise to a fascination, from which it is impossible to escape. The richness and power of Helmut's character might indeed easily stun others were it not for his keen sense of humor, upon which we also rely when Helmut reads these lines.

With this Special Issue, we celebrate the richly deserved election in 2018 of Helmut as a Foreign Associate of the US National Academy of Sciences, USA. While Helmut's

achievements have been documented in other editorials [1–3] and he has been interviewed on several previous occasions [4, 5], here we asked Helmut some questions on issues that have intrigued us:

Question 1: What is the role of mentor in science? Who mentored you and what has been your style of mentoring?

HS answer: The role of the mentor is somewhere in between that of a gardener and an investor of venture capital. In my view, he or she must above all provide an environment that fosters creativity. In doing so, he or she should seek a balance between rigorous criticism and encouragement, particularly encouragement for high-risk research, while not losing out of sight what is feasible and what is not. For me personally, the natural-product chemist Ferdinand Bohlmann was the ideal mentor because already during my Ph.D. studies he granted me all the freedom I wanted. I hardly benefitted from his mentoring in terms of technical expertise, but he supported my striving for early independence in an exemplary manner and, if necessary, gave me fierce support against our conservative faculty. He acted upon principles, which I have also adopted myself: Have faith in young people and let them grow freely, work together with students who burn for science and, to paraphrase Augustine, help to spark the intellectual fire in them.

Question 2: In your role as Humboldt President, you interacted with a range of politicians. How do science and politics mix?

HS answer: The Alexander von Humboldt Foundation is unique in many respects. For instance, it does not possess any significant endowment funds, but receives an annual budget of approx. 120 million Euros chiefly from the taxpayers' money. As the President of the Foundation, I therefore, year after year, had to convince the parliament and the administration of the value of our work. And the policymakers accepted the foundation's approach to support persons instead of projects and to base its decisions solely on the scientific excellence of the nominees. A high-profile diplomat once referred to the Humboldt Foundation as the "Rolls-Royce of German science politics" – very true indeed! The success stories of Humboldtians prove how well and wisely the money invested in the foundation is spent: At present, the Humboldt network reaches out to > 140 countries all over the world and consists of > 30 000 scientists, who have become partners and friends to their colleagues in Germany. It also seems worth mentioning that 45 of the 56 Humboldt Nobel laureates had received an award from the Humboldt Foundation long time before they got the phone call from Stockholm. Clearly, the Foundation must have a nose for finding young talents!

Question 3: What are the challenges for young scientists?

HS answer: A major problem lies in the unreasonably high expectations, which many young scientists have to face. A

second problem is the ill-advised practice to rely mainly on bibliometric measures for judging the quality of research, in particular that of scientists in an early stage of their career. Likewise, it is counterproductive to set fixed targets for newly appointed scientists because these targets tempt them to focus on research topics that promise fast and easy success. These developments are jeopardizing research that aims at going beyond the current state of the art, and, thus, they threaten to cause severe damage to our science system. Therefore, it is high time for a drastic change, as also demanded in a recent memorandum of some of the leading European academies of science.

Question 4: What is the future of peer-review publishing? How are you personally coping with the ever increasing number of scientific articles?

HS answer: The problem is well known, but apparently it lacks a simple remedy. Despite all of its shortcomings, I would not like to dispense with the peer review system. Even though reviews sometime can be rather annoying, they are after all meant to ensure quality control and to improve a paper. I personally evaluate on average one to two manuscripts or a research proposal per month or write a review for an appointment committee etc.

Question 5: What do you think are the challenges for gas-phase ion chemistry in the future? Are we already past the zenith, or does a new golden era beckon? How would you advise a young researcher interested in pursuing a career in gas-phase ion chemistry?

HS answer: From the Ecclesiastes we know: "To everything there is a season". In science, too, different fields pass through various stages. Take for instance the rise, fall, and rebirth of physical organic chemistry! I think that one should abandon a field if it no longer offers any new or fundamental questions or if the obtainable results only lead to incremental advances. One should also stop a project if it turns out that the currently available methods will not suffice to solve the problem at hand – but do not give up too soon, particularly not on gas-phase ion chemistry and physics, or would you?

References

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