



This interview is with Stéphane Kenmoe, who is not only a promising young researcher, but also an outstanding and active science communicator – worldwide.

Science and society – a good team!

Let's show the attraction of science all over the world!

An interview Stéphane Kenmoe

First question, straight to the heart of your work as a scientist and communicator of science: could you explain your field of research to a non-expert?

My field of research is Physical Chemistry and I am associated with the Faculty of Chemistry. We work on chemical processes that lead to the production of clean, responsible and environmentally friendly chemicals via oxidation. That means, we study chemical processes that minimize pollution.

Chemicals are used to fuel engines, cars, ships, boats, planes, which are all part of everyday life. All those chemicals are produced by industries. One of the processes

used to generate those chemicals is catalysis. This process accelerates and produces reactions in a more effective way by combining or splitting chemical components. We can distinguish homogeneous and heterogeneous catalysis.

In homogeneous catalysis, the reactants and products are all in the same phase. It is a bit like cooking a soup: the different ingredients are all in the same phase while they are being cooked; they are all liquid after mixing and the catalyst is indistinguishable from the products. Heterogeneous catalysis is different, though. The chemical reactants and the catalyst are in different phases, for example in

the gas and liquid phase, and the reaction takes place on the surface's catalyst which is in a different phase, very often the solid phase. That is why the process is called heterogeneous. The surface is solid, but the chemistry is happening in the soft phase. This is a very efficient way of accelerating and to rationalize chemical reactions as the catalyst can be reused. Nowadays most industrial chemical processes rely on this type of catalysis.

Gerhard Ertl received his Noble Prize for his research on the advantages of surface reactions in heterogeneous catalysis such as speed, large scale production and selective design of products. Metal surfaces

have widely been used to perform heterogeneous catalytic reactions. Some of these reactions take place in the gas phase and others in the liquid phase where water is present in operando conditions as solvent. Metal-based catalysts have by now been well investigated in catalysis processes, both experimentally and theoretically. When it comes to oxides, that is not the case at all.

Oxides are abundantly available, cheaper materials compared to metals. In fact when retrieving metal from the ground, you extract raw material. An oxide will immediately be formed on the surface of this raw material because nearly no material can remain pure after being exposed to air, apart from noble metals like gold or platinum. For example, iron and cobalt are very common in the ground. That is why they are interesting catalysts and why researchers are curious about such oxides in catalysis processes as is presently the case in the Collaborative Research Centre (CRC) 247 "Heterogeneous Catalysis of Oxides in the liquid phase".

There are many factors that can accelerate a chemical reaction. It is not usually sufficient to put a chemical onto a surface or put water on top; you need external factors like light, heat or electric currents. Accordingly, we talk about photo-, thermo- and electro-catalysis. There are experimental groups and theoretical groups in the CRC and I myself am in a theoretical group. A very close understanding between experimental groups and theoreticians is essential. Professor Spohr, who leads the group I am working in, has developed expertise in simulating interfaces between solids and water. We would like to give theoretical insight to the processes that take place, we try to provide the theoretical basis for the experiments, we build models and try to get insights into what is happening in the experiments conducted by our colleagues. We simulate these interfaces between metal oxides and water and try to

understand and explain what happens at the atomistic level.

What drives you to be such a dedicated science communicator – not to mention the fact that you are a good scientist, too?

It is probably where I come from. There is no big enthusiasm towards basic science in Africa. Most young people but also decision-makers do not have science on their radar. Making science more popular will help move it into the spotlight. Some people needed to make a start – and I am one of those. I started to write books, for example a science fiction novel. It is in my French mother tongue. It is about science that enlightens cities: <http://www.editionsbinam.com/Ouvrage/la-science-illumine-ndjocka-city/>. And then, I adapted this fiction into a TV series. The trailer is already on YouTube: <https://www.youtube.com/watch?v=IolSvBK7pxI>. Scientific insights are presented in one and half minute pieces at the end. It is set in Cameroon. The TV series is a great vehicle for reaching especially younger people and evoking interest for science.

Of course, there are huge differences regarding scientific culture between Cameroon and Germany. There are many good scientists in Cameroon, but what we are missing is scientific culture. Writing, doing movies, talking about science – all that contributes to spreading the word about science.

In Cameroon and in Africa in general, football is more important than science. Can you imagine that? I want to contribute to changing that. Science has all the prerequisites to get more attention.

For example, the coronavirus situation makes very clear how important and essential science communication is. It can easily lead to catastrophe if a government or politicians are not able to well communicate their actions, which are based upon scientific findings or knowledge.

Will we be able to watch the TV series you were talking about earlier in Germany?

For the whole series, we are in negotiations to sell it to other countries, for example many African countries or France. It may well be that it comes to a lot of places all over the world. Spread the spirit.

What are your wishes regarding science communication?

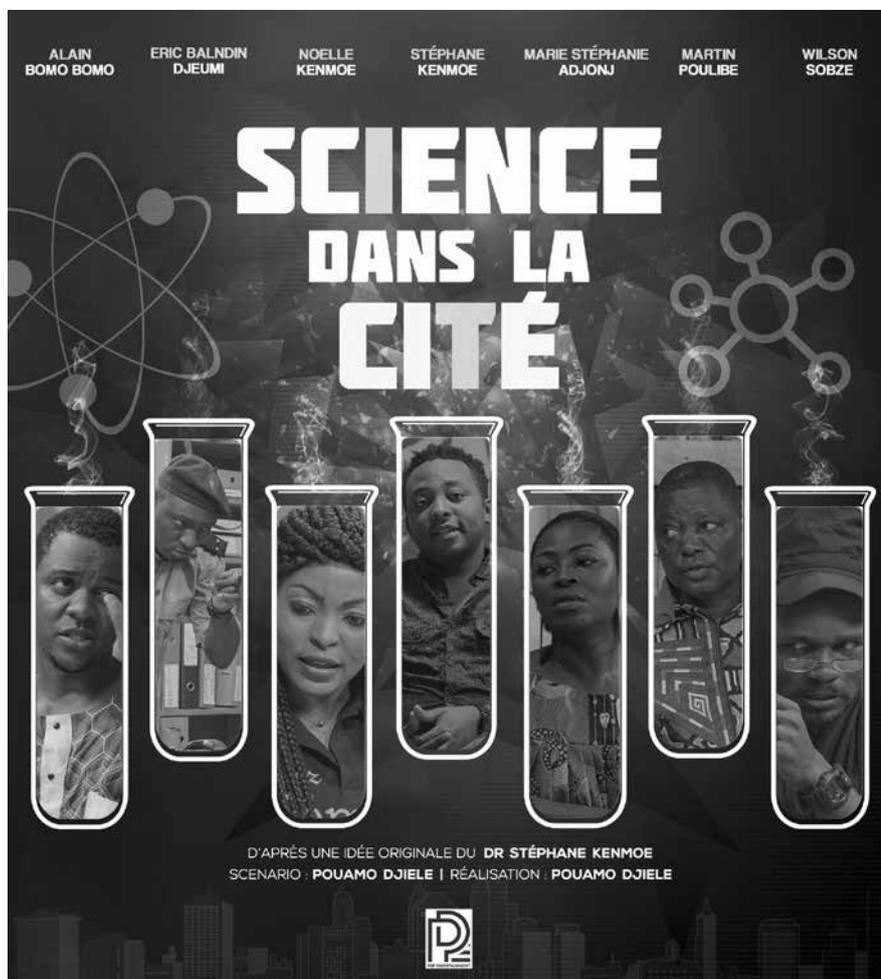
More freedom to communicate what scientists are doing would be very useful. Scientific freedom is not ensured everywhere. There are constraints; under certain conditions, scientists are not allowed to talk. Scientific communication should be a matter of course, something normal.

I am a supporter of open science. It should be available to everyone, not only the privileged. It needs to be attainable and open access is vital. Academic freedom is crucial to Africa. In some countries, scientists are not always open to talk to journalists about science. And sometimes an openness towards science journalists is missing.

What do you think are the reasons?

Firstly, many scientists do not know how to best communicate their topics to non-experts. It would be good if those scientists were to talk about what they are doing. There is a lack of communication skills: although scientists know exactly how to talk to their community, it is often complicated for them to talk to the general public about their subjects. Unfortunately, there is an ambivalence about communicating science to the public and to inner circles. There are still scientists who are not comfortable with talking or writing about their subjects to non-experts.

I, for example, benefitted very much from the soft skills training which I took when studying at the International Max Planck Research School (IMPRS), not only for



(1) TV series poster.
Quelle: Stéphane Kenmoe

science communication but in general. Soft skills training is crucial, and there are still too few courses about science communication. Scientists need to learn to talk about science.

You are very gifted when it comes to talking about science and reaching people...

I do not know, but I strongly feel communication is the key. Nowadays, communication is probably as important as being a good scientist. There are still some who feel that they are not serious scientists if they explain science to everyone.

For Africans, it is a dilemma. If an African who does research in Germany publishes 20 papers per year, they contribute to the scientific community and to excellence in

science, but they are not very helpful to the people in Africa. If they talk about what they do in Germany to Africans, they can inspire vocations, serve as a role model, etc. In my home country, Cameroon, most people do not know what we as scientists do. So it is the least we can do to talk about it.

And Germany is the right place for you to be at the moment?

I am more useful to Cameroon when I am here than when I am over there. Let me explain: I would not be able to conduct my research in Cameroon. As I mentioned earlier, I do my research in the field of computational simulations. We need electricity for that. In Cameroon, they often cut off electricity for five, six hours a day. So it would be

impossible for me to do the same kind of research there. Sometimes you even stay without electricity for a week. We do not have supercomputers; simulations need to be done on your own personal computer or laptop. That means you cannot do a lot of simulations as there is a lack of computational power. Even simulating a single drop of water requires a lot of (super)computing capacity if we want to investigate it from a nano-perspective. We cannot investigate even a simple cobalt oxide nanostructure with a water film on top with only a personal computer.

What are you doing to bring science expertise to Cameroon?

What I do is go back every year with experts from Europe – my connections are in Germany, Italy, France and a lot of other countries. In 2019, for example, I went with Professor Spohr from the University of Duisburg-Essen. He taught molecular dynamics simulations to students. And, as I do this every year, I bring back knowledge and expertise. I try to raise interest for the subject and science in general in the young generation. If somebody is interested, we start collaborating. That works even from a distance. I have tried to organise that students who perform well during the training could be rewarded with a trip to Germany in order to strengthen their capacities. Unfortunately, due to the coronavirus pandemic, they were not able to come this year although the visa had already been issued. That was very disappointing. But I am sure they will still come, only later than planned. They will work in research groups for three months, and they will even go to a different country for some time to gain more experience in different surroundings. The more people get to leave the country for a while to gather experience in different environments and bring their knowledge and expertise back, the more science in Cameroon benefits. Three young researchers were sup-



(2) Training in the Cameroonian City of Dschang.

Quelle: Stéphane Kenmoe

posed to be in Duisburg-Essen. If we are many, we have the power to change things in Africa. But first of all, we need stable computational power. Otherwise, there is no way that we can do computational simulations there.

How does the coronavirus pandemic affect your life as a science communicator?

It gives me more credit towards my actions. My actions, as I have mentioned before, are always devoted to the African community. Because, if we want to make the world better, we should not only improve one part of the world. In many countries, including Cameroon, we have to deal with a lot of scepticism towards or even denial of science. But when the coronavirus came, the situation was different. People could see (experience) that Science communicators were right about the

dangers of the coronavirus. That is how we can convince sceptics.

How does the pandemic affect your networking activities?

In addition to scientific conferences, three conferences that were particularly important to me were cancelled. They were all specialised in networking and science communication. The US-American Aspen Institute has recently released a new programme called “Science & Society”. I was very happy to be among the speakers because we all try to connect science and society. I was invited to talk about activities in Cameroon at this global meeting with people from at least sixty countries, which was supposed to take place in Rome in March. The second one was a meeting for young African scientists in North America. It was supposed to take place in Montreal, Canada, in May. The third one was

the conference of the African Physical Society, for which a special section on connecting with the press was planned. This conference was planned for November, but we had to do it virtually.

What is the difference between working at a Max Planck Institute and working at a German university?

Well, the Max Planck Institutes may have an excellent reputation. However, I have come to the conclusion that science is not only about the institution, science is about the people with whom you conduct research. At universities, there are a lot of very good scientists. Being at the Max Planck Institute does not necessarily make you great. For me, what is important are your personal efforts, the guidance of mentors and the good interaction with colleagues.

Women in science is another important topic. Still only about a quarter of German professors are female and we do not see very many women in high academic positions on a global scale. Is there an African organization especially for the promotion of women in science?

The “Academy of Sciences for the Developing World” (TWAS) in Trieste also maintains an “Organization for Women in Science for the Developing World” (OWSD) with satellites and representations in Africa and in Cameroon. They work on getting more women into science and high-level positions within science.

What are your personal plans?

My personal plans are flexible. Science can be done everywhere. I do not have a permanent position, so I am still planning my future. Let’s see what happens. I am open to a lot of things. Ideally, I dream of a professorship. Science is what I want to do. I would really like to be a professor at some stage, a scientific communicator who contributes to both science and society.

About the interviewee

Stéphane Kenmoe is a young researcher at the Department of Chemistry in the team headed by Professor Eckard Spohr. His work in the field of “Molecular Dynamics Simulations of Transition Metal Oxide-Water Interfaces” is part of the Collaborative Research Centre/Transregio 247 “Heterogeneous Oxidation Catalysis in the Liquid Phase” led by Professor Malte Behrens. He was awarded the Diversity Prize of the University of Duisburg-Essen. Stéphane is one of the most popular science communicators – not only in his homeland Cameroon but throughout Africa. He also provides training at African universities, is a regular guest on Radio France International and Cameroonian television, and has produced a movie series on science.

Stéphane studied Physics in Cameroon and completed his master’s degree there. His achievements secured him one of the highly competitive places at the International Centre for Theoretical Physics in Trieste, Italy. There, young scientists from emerging countries can qualify for research at an international level. In 2011, he became a doctoral student at the Max Planck Institute for Iron Research in Düsseldorf. He is a board member of the African Physical Society.