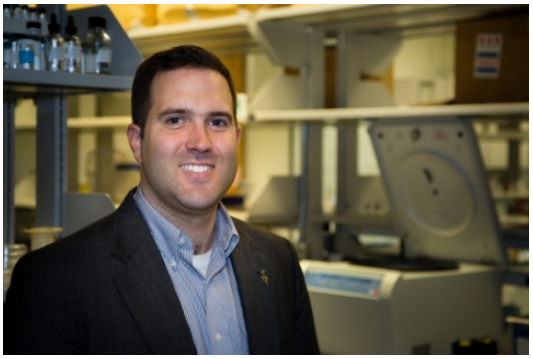
Dr. Jeffrey Rimer (Associate Professor of Chemical and Biomolecular Engineering at the University of Houston, USA) is recipient of the first MCEC Lectureship Award. In May 2017, he visited the different MCEC research groups, gave scientific lectures and participated in scientific discussions. Christine from MCEC Office sat down with Jeffrey and asked him about his experiences in The Netherlands, his projects and research and 'going outside the box'.

"A lecture is a conversation, even though you're monopolizing the time"

Interview with Dr. Jeffrey Rimer



One thing that stood out for me, is that during my lectures, I didn't receive a single softball question - the kind of generic questions where 'an easy one is thrown out'. Instead, the questions following my lectures here, were very detailed and fundamental, and showed a good understanding of the matter. A lot of times, attendees would for example pinpoint certain things that I intentionally left out for the sake of time. They seemed very engaged in the talk and a number of people wanted to meet with me outside of the lecture as well; sometimes specifically about my research, but sometimes we just talked science. It was real fun.

What was your talk about?

In my research group, we work on two applications concerning zeolites. One is trying to develop new materials and ways of characterizing materials, understanding how they're formed and controlling specific aspects of that. The other is, to test them in catalytic reactions to see their performance and learn more about how the change of these materials in various ways, effects the outcome in performance. Since I was coming here specifically for the catalysis center, I focussed on the latter in my talk. Zeolites are important in various applications but by and large, catalysis is the biggest area where they're used by many (petro)chemical companies.

How did you prepare for this lecture, knowing you would be speaking to an audience consisting of different disciplinary backgrounds and various levels of expertise?

A lot of my talks have been trained to do just that – cater to a diverse and multidisciplinary audience. It's a balance act between keeping it interesting without getting too concrete. So usually when I'm giving these talks, I try to present an overview rather than details. Focussing on the challenges associated with what we're doing, for example. How does what we do fit into the bigger picture? In essence, you want the attendees to feel like they've gotten something out of it. You want them to be engaged in the talk.

Presentation and presentation style is certainly something we emphasize quite a bit in my research group. How do you structure a talk with slides and create a cohesive story that flows clearly? I've been on the other end, the receiving end, of talks where people would just dive into

the details without knowing their audience's backgrounds. I can tell you, it's not very enjoyable from the audience's perspective.

So what do you tell your students?
What I always tell my students is this: when you're giving a talk, it should be a conversation. You need to speak to the audience; you need to tell a story and not just present slide after slide while summing up details; they need to be able to follow you. You try to form a connection, you make eye-contact; you bring people in and try and get them involved and energized. You're not lecturing them: It's a conversation, even though you're monopolizing the time.

> "The risk you run, is that you're spreading yourself too thin."

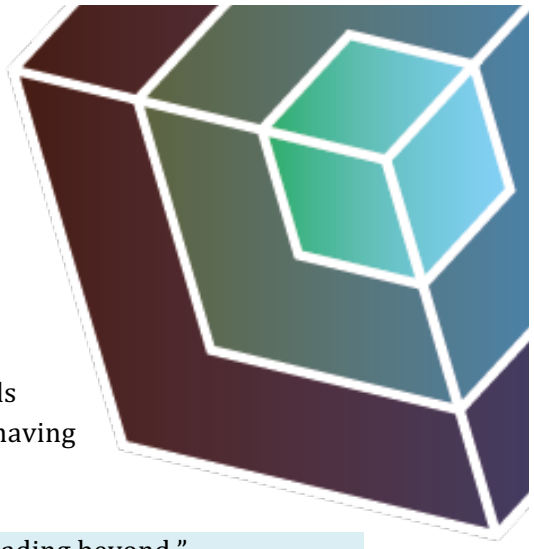
How can you relate to the multidisciplinary fundament of our research center?
One of the unique things in my research group is that we work in two distinct multidisciplinary areas: catalysis and biomaterials. I always integrate some aspect of that in my talks, though not as much during these MCEC Lectureships. Everything we do is focused on crystal engineering which touches upon many types of materials and applications. For instance, diseases that involve crystals then become a link between research and application. Many techniques we've learned in one area, we apply to the other and that gives way to 'thinking outside of the box'. You can take things from one area and use it in unique ways, which, sometimes, is high risk. It doesn't always work out the way you intended it to.

But 'going outside of the box' is hard. Because what is the trajectory? You see people who will do their PhD, then their postdoc in a similar field until one day they take a position in that same field… they're not really branching out. And that's understandable: the risk you run, if you do branch out, is that you won't be able to bridge those different fields in a logical manner. You would be spreading yourself too thin.

What was your trajectory?
Seeing a presentation by a Santa Barbara professor when I was in my PhD, on biomineralization: how silica structures form in marine organisms like sponges and diatoms. Because the material was the same as the one I was working on with zeolites – silica - I drew a connection. What if what I've learned in one area, can be applied to another?

> "We can work on those materials while it is still in alliance with our engineering mentality of always having an application in mind."

That almost seems like a lucky course of events: being at the right place at the right time, having an Eureka-moment that led you to where you are now. How much of this trajectory was a conscious decision?
In hindsight, things have fortuitously worked out in many respects, which is fortunate because I didn't really plan the exact trajectory. Ultimately, I'm in an engineering department at Houston. Had I pursued my original thought of working with diatoms, there's no way that would've worked. There is no logical utility.



In my postdoc I worked with kidney stones rather than diatoms; and by taking this route it has landed me in a place where I'm now talking about drug design and working with medical doctors and talking to companies about our patents. Pushing through with what might be a new drug; treating diseases. These are the applications that bridge science and engineering. We can work on those materials while it is still in alliance with our engineering mentality of always having an application in mind.

"It just takes time to start learning new topics and reading beyond."

So in the end it worked out well, but that way of out-of-the-box-thinking is not something that happens overnight. Ultimately, if you have an open mind and you're always seeking to learn outside of the immediate field that you're in; if you have a natural curiosity that takes you beyond the borders of your own specific work; you will find things. And I think it just takes time and effort to force yourself to start learning new topics and reading beyond.

It is something you can practice?
It is. Sometimes it might be a conscious effort that you have to make, to get yourself thinking along those lines. It might not click initially, but the more you search and the more you try to expand, the more you will see new opportunities.