

IM GESPRÄCH MIT JEFFREY „JEFF“ NORDINE

Dr. Jeffrey Nordine hat an der *University of Michigan* in der Arbeitsgruppe von Prof. Dr. Joseph S. Krajcik zur Entwicklung einer Unterrichtseinheit „Energie“ promoviert. Danach war er als Assistant Professor for Physics Education am *Trinity College* in San Antonio, TX, USA tätig. Aktuell ist er Chief Scientist des *San Antonio Children's Museum*. Von 2014 bis 2015 ist er außerdem als Gastwissenschaftler in der Abteilung für Didaktik der Physik am IPN tätig.



» ENERGY IS PERHAPS THE MOST IMPORTANT OF ALL SCIENTIFIC CONCEPTS «

Jeff, welcome to IPN. You will be a visiting professor at IPN throughout this year and next year! Can you briefly introduce yourself to our readers?

First, let me say how excited I am to work with the incredible colleagues I have met at IPN. It is a real privilege for me to collaborate with such talented science educators. When not at IPN, I work as the Chief Scientist at the San Antonio Children's Museum in Texas. My Texas colleagues and I are busy designing a new museum from the ground up. I spend most of my time developing science activities for young children and professional development experiences for their teachers. In my research, I investigate how to present the energy concept to young learners.

This sounds indeed interesting. Why do you think energy is such an important topic?

Energy is perhaps the most important of all scientific concepts. We have never seen a violation of energy conservation, and energy is a central concept in every scientific disci-

pline. Further, energy is a critical idea for making wise decisions in our personal lives and for setting sound public policy.

Where do you see the white spots in the current research base? What do you think are the most important issues to address in the teaching and learning about energy?

We know a great deal about the misconceptions that students tend to hold about energy, and we are developing a stronger understanding of how students tend to develop ideas over time. Scholars from IPN like Reinders Duit and Knut Neumann have made valuable contributions to this knowledge base. What is currently missing from the research is empirical study comparing how different approaches to energy instruction impact the character of students' understanding of energy and this understanding affects their preparedness for continued learning. I am excited to be involved in projects with colleagues from IPN in which we will be conducting such studies.

You have been working as a curriculum developer and were part of a team

that developed a very promising middle school science curriculum. What do you think are the most interesting issues in this curriculum that could be interesting to German science educators and science education researchers?

*I was honored to be on the development team for a curriculum called *Investigating and Questioning our World through Science and Technology (IQWST)*. I believe that German science educators would be most interested in how IQWST is designed for intra- and inter-unit coherence, how it presents new ideas through student-generated evidence, and how it supports students as they develop sophistication with scientific practices over time.*

As you know in the past years a particular focus in science education research in Germany was put on assessing students' competence in science. What innovations would you like to see in assessing students understanding of energy?

I would like to see an increased emphasis on understanding how students current understanding of energy affects their ability to learn about energy in the future. Every student enters school having some intuitive experience with energy, and these ideas affect how they use the concept. Rather than checking whether students can identify the correct energy idea, I am interested in exploring what ideas they choose to activate as they reason about new energy-related situations and how this affects their ability to make sound decisions. After all, this is how they will actually use the energy concept when they are done with school and functioning as citizens.