Richard Binzel of the Massachusetts Institute of Technology was awarded a 2025 Barry Prize for Distinguished Intellectual Achievement. In this video, Santiago Schnell of Dartmouth interviews Dr. Binzel about how space exploration taps into a deep root in human nature, why scientists have an obligation to discover more about our universe, and the importance of nature and truth for the university's mission.

Santiago Schnell, Dartmouth

I have the pleasure of talking to Richard Binzel, who is professor of planetary sciences at the Massachusetts Institute of Technology, where he specializes in the study of asteroids and the planet Pluto. I'm here representing the American Academy of Sciences and Letters as a member of the board, and we recently had the pleasure of giving to Richard the Barry Prize for Distinguished Intellectual Achievement.

Richard, thank you very much for accepting to have this conversation, I'm really excited.

Richard Binzel, Massachusetts Institute of Technology

Santiago, it's great to see you, thank you so much for your time.

Schnell

Let's start the conversation because I have some fantastic questions for you. What are some of the underappreciated ways that the work that you've done in your field is not fully grasped in terms of understanding what human beings do for the flourishing of humanity?

Binzel

It's an interesting question. I'm basically a space explorer, and I use telescopes and space probes. I've sent four probes out into the solar system as part of a team. These are huge team efforts, so I'm just one small member of many teams. What people don't appreciate or understand about space exploration is how inspirational it is to the public and to the national psyche. Anytime I talk to someone and say, I'm an astronomer or I'm a space scientist or a planetary scientist, they always say, I've always been interested in that. The public has this great appreciation for it.

But in the greater mindset, people don't understand or appreciate how inspirational it is. They don't understand why we do it, and the reason we do it is basic human curiosity. If humans weren't curious, always trying to find a next frontier or the next place where your hunting and gathering would be successful, we wouldn't have a species or we wouldn't have survived until today. This basic curiosity to go and see what's over the next hill, what's out beyond the earth, is intrinsic to human beings and rooted in our survival to continue to hunt and gather. If we just stayed in one place, we may not have ever survived.

One other thing I would say is that it drives this curiosity to explore. It's a special human capacity to want to think and be curious beyond what we need for day to day. There's this human spirit that is really important about space research that people don't understand. Maybe the best thing in the current political world is space exploration. It is nonpartisan and has really great universal governmental support. So it's a pleasure.

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Schnell

I think that's fantastic. I'm curious about one thing specifically. When you talk about the curiosity, the exploration, finding what is over the next hill or on the top of the mountain, regarding space, some people ask, but why so far away? How would you respond to that?

Binzel

It's a great question; I get it all the time. What's important is the context. We want to understand the earth. Obviously, we understand the earth, the climate. These are really important issues in our time. But we need context. We need to know how nature works in many different ways. That's what we find as explore other places. We're getting new insights on how nature works. We find these applications that come back to the earth. It is directly applicable to what we do here on the earth.

But also, coming back to that inspirational point, if it inspires curiosity and inspires people to want to study science, medicine or engineering, then it's great. It gets them hooked. It gets their curiosity hooked into taking their studies seriously. Then they become the next great bioscientists studying enzymes or catalysts or really important things like that.

Schnell

You said something when you answered the first question about team science. I'm wondering, it looks like it's not possible outside the university setting, the research setting. How does the public at large understand the mission of the university, what the team science people do in the university? Do you think that the general public understands as well the mission of the university in that context?

Binzel

We're not in a particularly good era for how universities are perceived. I relish the public perception that professors are absent-minded and they don't know how to tie their shoes. What's beautiful about that is sometimes it's true. But what the public doesn't understand in the partisan way universities are looked at right now is that, as professors in the university, particularly in the physical sciences, we can certainly say what we seek is the truth.

Nature is the ultimate authority here. There's only one truth, and that's how nature works. It's our job to try to decode as much of how nature works in the language that we have for it, whether it's a verbal language, a descriptive language, a mathematical language or a symbolic language like chemical equations. We just want to get to the root of how nature does what it does. It's just that innate drive toward the true beauty and essence of nature. That's what motivates all of us. The public somehow thinks we always take a partisan view of this, that or the other. Nothing could be further from how I view my research and what I do and how I pursue my research day to day. I simply want to understand how nature works and not find myself pulled into social issues of the day. That's just my mindset, for better or for worse.

Schnell

I imagine that you need team science because the collaboration with other scientists helps you to complete the thought that maybe you cannot see with your own expertise. So that's why we need the

university. Do you feel that in your research that's important, having a chemist, a physicist, a mathematician all working together on the same problem or even a philosopher? How are those working in your academic discipline?

Binzel

Yes**,** the university environment is absolutely thrilling when you have expertise across so many different fields. Very few problems settle themselves narrowly into one discipline. It usually takes a combination of multiple disciplines to solve problems. That's what I like about studying how planets work; you need to know physics, you need to know chemistry, you need to know mathematics, you need to know about climate and weather and so many different things. Even how humans interact with the environment. The university is just such a rich place of intelligent people, curious people, always willing to try to share what they know. It's just simply a privilege to be in a university setting and have all these fantastic colleagues around me.

Schnell

What would be the most surprising academic discipline that plays an important role in your research?

Binzel

What surprised me in my research and how things have evolved is the study of asteroids that pass near the earth. When we first started thinking about this scientifically, it was almost a giggle factor. People thought, seriously, do we have to worry about this? Then Hollywood made a bunch of really bad movies. Anytime you know something scientific or factual about something portrayed in a movie, you cringe at all the artistic license they take to make it a story that will sell tickets.

What's made me happy about the evolution of the field is that we've moved beyond the giggle factor. People are starting to understand that as asteroids go passing by the earth, we have to predict where they're going to be in their orbits. It's a little bit like trying to know where a hurricane is going to go once you see a low-pressure system in the Gulf. You'll see these maps of this wide range of areas where a hurricane could go. Sometimes we discover an asteroid, and we know in 20 years it's going to come very close to the earth. But until we've tracked it long enough, we can't say for sure that it's going to miss. More and more, we're starting to see the public understand that. That's been very heartening.

Even more so is the fact that we're getting new capabilities to search what's out there and make sure there's no asteroid or comet with our name on it. These things do happen in nature. They're very rare events. It wasn't a good day for the dinosaurs 65 million years ago. The dinosaurs didn't have a space program, but we do. We would not want to be embarrassed by being taken by surprise by an asteroid or comet impact that we could have seen coming.

In terms of the evolution of the field I'm in, I've been satisfied in the sense that I've always felt that, as a scientist, I have a moral obligation to inventory what's out there and make sure that there are no surprises in the coming decades or even the coming century. It would be a moral failure if we could have found something that would ruin our day. But now we've got capabilities, new instrumentation, a new survey tool down in Chile called the Vera Rubin Telescope, a new satellite going up called the Near Earth Object or NEO Surveyor Telescope. So, we're finally going to get an inventory of what's out there. That's been a very satisfying evolution in my corner of the field.

Schnell

Artists in the university actually have helped your discipline to become known to the general public and have refined the way we understand things because when they make their movies, they raise attention to important problems that we're trying to solve. I found that really interesting.

One final question. What has surprised you the most over the last five years in your own work or in the academic work that you have experienced?

Binzel

What has surprised me is in this topic of understanding space hazards to the earth, that we've moved beyond the giggle factor to taking it seriously. I've been working on this kind of problem since the 1980s with one of the greatest figures in the field, a guy named Eugene Shoemaker, who happened to have discovered with his wife, Carolyn, a comet called Shoemaker-Levy 9 that impacted Jupiter back in the 1990s. That raised a lot of awareness that things that make craters are still out there hitting the moon, hitting Jupiter. Occasionally we get something that comes in over the earth. There was one over Chelyabinsk, Russia, in 2013. We pick up meteorites from those. The surprising thing or the satisfying thing or the relief is that this whole thing is being taken seriously with just the right amount of dedication to inventorying what's out there and making sure that we don't get taken by surprise.

Schnell

This has been a very interesting conversation, Richard. I've enjoyed it a lot. I hope the people who watch this enjoy it as much as I have. Thank you very much. And once more, congratulations for winning the Barry Prize.

Binzel

Thank you, Santiago. It's a pleasure. And I'm so grateful to the Academy for the recognition and the chance to meet and interact with so many wonderful people.