

Physics  
At Work

## Dr. Neil Tyson

Director of New York's Hayden Planetarium;  
New York, NY

As a young boy, Dr. Neil Tyson would observe the night sky from his tarred rooftop apartment in the Bronx that was built on one of the highest hills in the borough. "Nothing I can write will capture the acute cosmic imprinting from my first view from the Bronx of the waxing crescent moon across the Hudson River," writes Dr. Tyson in his 2004 memoir titled *The Sky Is Not the Limit: Adventures of an Urban Astrophysicist*.

Dr. Tyson is currently the Director of New York's Hayden Planetarium at the American Museum of Natural History. He earned his B.A. in physics from Harvard University in Cambridge, Massachusetts, and his Ph.D. in astrophysics from Columbia University in New York City. To top that off, his contributions to helping the public understand and appreciate the cosmos have been recognized by the International Astronomical Union in their official naming of asteroid "13123 Tyson."

"At the moment, life on Earth is the only known life in the universe, but there are compelling arguments to suggest we are not alone," Dr. Tyson writes in the *Natural History* magazine. "On the chance that such a civilization exists, radio waves would be the communication band of choice because of their ability to traverse the galaxy unimpeded by interstellar gas and dust clouds."

Dr. Tyson believes physics helps him in his personal and professional life as well. "When used as a lens through which I observe life, it allows me to look at problems in a way that often gleams immediate insight into their solutions," he said. Dr. Tyson concluded by saying, "Being scientifically and mathematically literate is not about what you know, but how you think."



## Dr. Michio Kaku

Professor of Theoretical Physics;  
New York, NY

Dr. Michio Kaku, Professor of Theoretical Physics at City College in New York, believes a unified explanation of everything is attainable in his lifetime.

Currently, Dr. Kaku is absorbed in defining the "Theory of Everything," which begins with the four forces: electromagnetic, gravitational, and weak and strong nuclear forces. The Theory of Everything is a theory of abstract physics that attempts to fully explain and link together all known physical phenomena.

He anticipates that his research will open many doors regarding space and time. "In the future, when we unify the four forces, it will reveal the secrets of space and time."

## Dr. Jill Tarter

Head of the SETI Institute;  
Mountain View, CA

Even as a child, Jill Tarter dreamed big. "I decided to be an engineer because it was the most masculine thing I could think of." She was the only woman in her graduating class at Cornell University to earn an engineering degree, and she also earned advanced degrees in astronomy.

Dr. Tarter helped found the Search for Extraterrestrial Intelligence Institute (SETI), a private, nonprofit organization dedicated to scientific research, education, and public outreach. "We use radio telescopes to look for signals that only show up on one frequency. We are trying to find signals that cannot be generated by nature in terms of the physics we understand."



993

Active Physics

impression of Dr. Tyson's career and how it makes an impact on their learning.

Dr. Michio Kaku's firm belief in a unified explanation of everything demonstrates his passion to link together all known physical phenomenon. You might want to ask students what they understand by "abstract physics." Discuss why Dr. Kaku is absorbed in defining the "Theory of Everything." Ask how Dr. Kaku's profile would open the door to innovative thinking.

Dr. Jill Tarter's profile captures her strong love for scientific research. Have students write a brief summary of Dr. Tarter's profile. Ask them to describe how her passion for science played out in her life. Consider asking, "Why is engineering considered to be a challenging profession for women?" What does Dr. Tarter mean when she says that her organization is engaged in finding signals that are cannot be generated by nature in terms of the physics we understand? Ask your students to do an Internet search on SETI to answer some of their questions on whether there may be intelligent life in the universe other than our own. "What other aspects of her career stand out?" These questions will focus students' understanding and provide points of discussion that serve to emphasize the role of physics in Dr. Tarter's career.

## Physics At Work

*Physics At Work* illustrates how scientists' fascination with physical phenomenon in the universe led them toward establishing successful careers. Brief sketches of their lives show how physics has transformed their lives. Dr. Neil Degraffe Tyson's observations from his rooftop apartment left such a deep impression on him that he went on to become a distinguished

astrophysicist. His profile is perhaps best captured toward the end where he opines that being a scientist or a mathematician "is not about what you know, but how you think."

Consider asking students to recall a personal experience that transformed their lives and what aspects of Dr. Tyson's profile demonstrate his personal and professional success. You might want students to describe their