Research in Physics and Astronomy spans from the most miniature, elementary, and fundamental particles that hold our universe together, to the gargantuan astronomical bodies that exist on a scale beyond human comprehension. For Dr. Martin Houde of Western University’s Department of Physics and Astronomy, both cases are true.

Hailing from Quebec as a French-Canadian, Dr. Martin Houde attended the University of Montréal (Université de Montréal) where he attained a Bachelor’s degree in Electrical Engineering. After working for a few years in the aerospace industry, Dr. Houde concurrently returned to his alma mater to begin graduate studies in physics. With a Masters of Science in Physics he then went on to work for the California Institute of Technology (Caltech) in Hawaii at an observatory called the Caltech Submillimeter Observatory. The Observatory, which was open from 1987 to 2015, was designed to observe wavelengths emitted by celestial objects at a submillimeter level allowing for the study of molecular gases & small dust particles and how they contributed to star formation. Dr. Houde’s work there was related to engineering done on the telescope and he was able to gain a great deal of knowledge, practical skill, and aptitude in the field of astrophysical instrumentation. Dr. Houde completed his degree trifecta with a doctorate from where he started his journey as an academic—a PhD in physics at the University of Montréal. After continuing his work at the Caltech Submillimeter Observatory for 11 more years as a senior scientist, Dr. Houde moved to Western University assuming the position of Assistant Professor. Now a Full Professor, Dr. Houde is an astrophysicist whose scope of practice focuses on star formation and the physical processes behind it.

“Star formation was my main area of research...from my time at Caltech until recent times [at Western] and it’s still one of my main thrusts”,
said Dr. Houde when asked to broadly describe his interests. A physicist at heart, Dr. Houde likes to understand the physical processes that take place within bigger questions. Much of his research regards the timescales of the formation of stellar bodies; that is, how long it takes for stars to form from start to finish along with what regulates these processes. “There are competing schools of thought”, explains Dr. Houde, “Some people will say it’s a turbulence from the gases that sets the time scale, other people say it’s magnetic fields...Where I come in, I like to look at the basic physical processes involved with magnetism and star formation and how we can measure and interpret how stars form.”

His work in astrophysics is pivotal in understanding very broad scope questions. When asked about why he believes work in astrophysics is important to the general public, he responded: “...you need to push the boundaries of technology...we embark on huge projects that call for technologies that are not there yet [but] we must develop it...although questions relevant to astrophysics may not be directly relevant to the population in general, that’s quite correct, the indirect effect of this research in technology will have an effect on society.” Beyond this, Dr. Houde’s work dabbles upon questions on a philosophical level. “It’s a human trait that we have to try and understand...this is practical and what we should do...Many people ask questions, deep fundamental questions about our origins—where do we come from, where does our universe come from, are we alone?—and these are questions that are addressed not only by astronomy but also through research in astrophysics. The bottom line is that people want us to do that.” Dr. Houde also firmly believes in the importance of producing good scientific research for the taxpayer. Aside from being a scientist, professor, and inquirer at heart, he routinely participates in activities that further provide for the scientific nourishment of the public.

Regarding more contemporary topics in astrophysics, Dr. Houde shows a support for current efforts in space exploration and discovery being carried out by organizations such as SpaceX. “Mr. Musk [pushes boundaries]. That, I think, is great. It’s a visionary type of work where there won’t be benefits tomorrow but it’s an avenue that needs to be pushed.” The recent announcement of the discovery of gravitational waves by the Laser Interferometer Gravitational-Wave Observatory (LIGO) also piqued Dr. Houde’s interest. He states, “this is an extremely important step in understanding our universe...it lifts a veil on things that we thought were there but we couldn’t prove...but now there are no doubts.” The technology used at LIGO also commanded praise from Dr. Houde as he remarked, “LIGO in itself is a fantastic thing because it pushes technology to a new level that was not possible before. We can now do things...with LIGO that people couldn’t even think about when they started... to me this is extremely simulating, very exciting.”

Dr. Houde’s advice to those interested in pursuing research delves deep into developing qualities and skills that allows one to develop a scientific perspective of problem solving. “To be a good researcher, you have to have a fairly broad set of skills...You need to master some tools, there’s a basic amount of fundamental knowledge you must have that you acquire at the undergraduate level and also at the graduate level.” When asked about the way a scientist must think, he gave a rather paradoxical, yet profound response: “You have to have a critical mind but you also have to have an open mind which is a tough balance to have. You have to be open-minded enough to be receptive to new ideas and consider them as such but you can’t
be so open minded that you’ll accept anything without critically assessing it. So you have to be critical, in a positive way...That is something that I think comes with time. It takes maturity and wisdom to do that...Beyond that you have to have a passion that will allow you to work hard... being smart is one thing but working hard and being committed is absolutely essential.”

Work being done in astrophysics is absolutely critical to pushing the boundaries of our understanding of the universe. Through the drive of learning and knowing the answers to questions in fields from metaphysics all the way to magnetic fields and stardust, scientists like Dr. Houde continue to innovate and discover so that we might better realize the bigger picture of our very existence.

To view more about Dr. Houde and his research, please visit his website at:

http://astro.uwo.ca/~houde/index.html