By: Maggie Beatson
As a college student, Professor Bryan Eichhorn started out on the premed track, but found his true calling after taking an organic chemistry class. “[Organic chemistry] was so cool that I wanted to do that,” he said. “Graduate school is when I really fell in love with research. It was one of the best times of my life.”

Now in his 22nd year at the University of Maryland, Eichhorn primarily conducts research in material science – the creation of new molecules with the ultimate goal of solving the energy and environmental issues – because he wanted his work to tackle big issues and to have a positive impact on society. One of his latest projects focuses on making new catalysts, a key substance involved in many industrial processes and products. “Catalysts are materials that convert chemical reactions at a lower energy barrier,” Eichhorn said. “Catalysts are used in everything, catalytic converters in cars, for example.” He has been working for the past five years on this specific project and hopes to ultimately create a new catalyst to aid development of fuel cells. “Fuel cells are devices that convert chemical energy to electricity without moving parts,” he said. “They’ve been around for a long time, but they have a lot of problems. All the problems almost entirely come down to materials, so we do material research to try and get that technology to work.” Eventually, he hopes that his research can be used to develop new technologies, such as developing cars based off of the improved fuel cells.

Eichhorn and his team have conducted all of their research in labs at the University of Maryland with the help of several grants from the Department of Energy, the National Science Foundation and the Navy. Some of their results have been tested on real-world scales with the help of Maryland engineers who create prototypes to test the fuel cells. Interestingly, the main focus of their research was found inadvertantly. “We made [an accidental] discovery on making a new catalyst that can actually work using natural gas in a fuel cell,” Eichhorn said. “If you can do that routinely that can be a very useful technology.”

For Eichhorn, a good part of his job’s pleasure comes from teaching his students and preparing them to help advance technology. “Training students for what some call ‘the third industrial revolution’ is very exciting,” Eichhorn stated. “Distributed power is already going away. Everybody’s going to have personal power plants in their house, at some point, and that’s going to require a lot of material science and technology.”

Eichhorn asserts that conducting research anywhere requires passion because it can be frustrating as the results are so unpredictable. “In research, you never know what’s going to happen,” he said. “You always think you know what is going to happen, but really something else happens, which is why it’s fun.”