

meet Paul

MATERIALS PHYSICS

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Could you use physics to make an MP3 player hold more songs? How about generating electricity from the sun with something far thinner than a human hair? For Paul Markoff-Johnson, the answer to both these questions is yes. Paul has spent most of his career working on creating incredibly thin coatings made of materials selected for their special abilities. To get an idea of how thin these coatings are, imagine slicing a dime horizontally into a thousand slices. The coating would be as thin as just one of those slices!

The material Paul picks for a coating depends on what he wants the coating to do. For solar cells, he needs materials that generate electricity when the sun shines on them. In disk drives and disks, like those used in MP3 players, the coatings must have magnetic properties to create many tiny magnets inside the devices for storing huge amounts of information.

Paul knows which materials to pick for these coatings because of his studies in physics. He knew from childhood that he was interested in a career in science. He had always enjoyed math, but hadn't really understood how it could be practically applied until he took his first physics class in high school. He found the class fascinating.

“Suddenly having an ability to explain the things I’m seeing around me with physics, like why a car goes, was really exciting to me; to be able to put that down in numbers and equations,” he said.

Paul also appreciated his physics teacher, one of his favorite teachers in high school. “He wanted the class to be about learning the material and figuring out how things worked in the world, and not about competing for grades and trying to be the best of the best,” he said.

When Paul started college he thought he wanted to major in engineering. But after a few engineering courses, he decided he wanted to study something broader, and chose physics. Paul continued his studies and earned a master’s degree in applied physics. Now Paul works as an engineer, and he’s glad that he chose to major in physics. He thinks his physics background broadens his career options, and would help him succeed in a number of different fields. In addition to making him versatile, studying physics gave him an invaluable skill. “You get that ability to walk into strange situations, unfamiliar situations, and think from what I call basic principles; to use a basic understanding of how the world works in order to solve the problem.”



Although Paul spent much of his career in disk drives, he recently moved into a new field—solar power. His goal is to use thin-film technology to create less expensive solar cells. Making the cells cheaper would make solar power more affordable and more likely to be widely used. That would help clean up the environment. “If I’m successful, if this industry is successful, we will have changed the world for the better.”

DID YOU KNOW...

That a physicist, John Atanasoff, invented the first electronic digital computer in 1939. Read more about him online at <http://www.johnatanasoff.com>.

