

Physics
At Work

Debra Rucker Coleman

Architect; Citronelle, AL

Architect Debra Rucker Coleman is the owner of Sun Plans Inc., and has been designing passive solar homes for several years. She believes her love for the environment steered her toward solar energy. Growing up in Arizona with parents who loved the outdoors, Coleman was always fascinated by the Sun and the sky.

After graduating from the University of Arizona with a Bachelor of Architecture, she began working for an architecture firm. "I was appalled at their lack of sensitivity toward the environment," Coleman states.

"I realized that in order to incorporate my design ideas, I had to work for myself."

Coleman opened her own business, Energetic Design, in North Carolina, and began designing for the local school district. She also became an energy consultant on residential development projects where she included passive solar energy. "At first, only 25 percent of my clients were interested in passive solar energy and I realized that the general public needed to be educated." Passive solar design revolves around one simple idea—to take advantage of the Sun's heat without the aid of any mechanical devices.

Passive solar energy is not all Coleman thinks about when she tackles energy efficiency: "I have to be aware of heat loss and heat gain. I have to understand that to let the Sun's energy in the house means putting the thinnest materials on the south side of the house," she explains. "A black roof will also absorb a lot more heat. For one climate you might want a black roof, and in another climate you might want a more reflective, or white roof."



Rochelle Boyl

Music Teacher;
Covelo, CA

Rochelle Boyl was introduced to living off-the-grid by her husband, a term which refers to living in a self-sufficient manner without reliance on one or

more public utilities.

But it is the couple's ingenuity with their resources that is not only keeping their way-of-life exciting, but is also keeping Earth green. "We have gravity-fed spring water, hydro-electric power in the winter and solar in the summer. The Boyl's emphasize energy conservation, regardless of its source. "You have to have the desire to want to live this kind of lifestyle. I enjoy learning and want to keep living off-the-grid," pronounced Rochelle.

Craig Robinson

Senior Composites Engineer,
Knight & Carver Wind
Group; National City, CA

Craig Robinson has over 20 years experience designing products from composite materials, including tennis rackets, bike frames, and fiberglass replica cars. Currently, he is a Senior Composites Engineer at Knight & Carver Wind Group, a company that began as a yacht construction firm and today is recognized in the wind energy industry for repairing and building turbine blades.

Craig is optimistic about the wind energy industry. "It is great to be a part of a booming industry. Wind, solar and geothermal are going to be a big part of the future," predicts Craig.



architectural design of a building can affect the energy efficiency of the building using the examples provided in the text and query the students for other ideas they have.

Describe how Rochelle Boyl's experience of living off the grid is a good example of how environmental concerns utilize science regardless of one's educational background. Discuss what living off the grid is and provide other examples if desired, such as the energy-efficient housing competitions or green home designs that can be found by conducting an Internet search. Ask students which items in their home they might be able to use off the grid and how they would do it.

Emphasize that many different people working together are needed to design a useful system. To design an alternative energy source, scientists, engineers, construction workers, architects, environmentalists, and many others are needed. In the production of alternative energy sources, Craig Robinson, an engineer, helps repair and build turbine blades that utilize wind energy. He also designs products from composite materials to recycle and build energy resources. Discuss with your class how and why energy is recycled. Ask students to list the energy recycling processes that are familiar to them.

Physics at Work

The different profiles presented in this section show how people from diverse backgrounds use the physics concepts from this chapter in their lives and their jobs. The profiles of professionals presented in this section demonstrate that there are no geographic, ethnic, or gender barriers for people who apply physics in their professions. It is not necessary to have an

advanced degree, to work in science, or to employ physics.

Point out that architect Debra Rucker Coleman's awareness of environmental concerns and her knowledge of architecture provided her with the opportunity to begin her own company using passive solar energy to design more energy-efficient and environmentally friendly structures. Discuss how the

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