The Design and Manufacturing of the Solar Furnace Reactor Table

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The James S. Markiewicz Solar Energy Research Facility at Valparaiso University will concentrate energy from the sun into a reactor containing unprocessed materials. The concentrated light causes a reaction to occur, turning unprocessed materials into alternative energy products. Accurate placement of the reactor at the focal point of the concentrator is necessary to allow the maximum amount of solar energy to enter the reactor. The Reactor Table was designed and built by Valparaiso University students and faculty. The table controls the placement of the reactor at the focal point of the concentrator quickly and easily by using a computer located in the safety of the Control Room. The operator can control the X, Y, and Z directions of the table to achieve the optimal placement of the reactor with an accuracy of ±0.5 mm.

Information about the Author:
Chris Baum is a senior mechanical engineering major looking to specialize in machine design, specifically the creation of efficient, clean machines. The design and manufacturing of this project was important in understanding how a project comes together and what factors go into the design of a machine. Zach Saylor is a senior mechanical engineering and mathematics major. His interest in sustainability brought him to the solar furnace project. Andrew Schiller graduated from the VU mechanical engineering program in 2012. He worked on the reactor table and louver system as his senior design project, and worked as a consultant on this project over the summer. Andrew will be working for Caterpillar starting this fall.

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