Equipment Grant Recipient

TEAM MEMBERS
Turk Alomari, Cody Griffin, China Johnson, Andy Lagrone

FUNDING
ASHRAE Grant $5,000

PARTNERSHIP
Department Funds $1,000

DURATION
8 months to design, build and test

Hessam Taherian, PhD, PE
At the time this project was carried out, Dr. Taherian was an assistant professor of mechanical engineering at the University of Alabama at Birmingham. He teaches thermal fluid systems courses and was the main instructor and coordinator for the thermal fluid systems lab at UAB.

His interest is in energy efficiency in buildings, ground source heat pumps, renewable energies, and distributed generation of power, heating, and cooling. In August 2020, Dr. Taherian joined Penn State Harrisburg's school of science engineering and technology.

Stirling cryocooler
The University of Alabama at Birmingham (UAB)

OUR STORY
The USU The team was consisted of 4 mechanical engineering students who enrolled in the capstone design course at UAB. The goal of the project was to provide an opportunity for the students to practice the engineering design process, step-by-step from concept generation, to prototype building, testing and verification of the final product. The device is used to demonstrate to students, what a successfully carried out capstone project should look like.

OUR PROJECT
The student team designed and built a deep freezer based on reversed Stirling cycle. Reverse Stirling cycle cooling is an environmentally-friendly method to create a deep freezer for various applications without using any harmful refrigerants. The students learned invaluable lessons through hands-on activities by applying the theoretical concepts which they learned in courses such as thermodynamics I and II, heat transfer, fluid mechanics, and thermal fluid system design. The device was able to achieve the set goal of reaching -50°C in less than 3 hours. The project was presented at the Media Day, to the public.

The project is being continued under another ASHRAE undergraduate grant at the Pennsylvania State University (Penn State Harrisburg).