

Idaho Incubation Fund Program

Progress Report Form

Proposal No. 6732
Name: Peter Mullner
Name of Institution: Boise State University
Project Title: Solid State Positioning Device for Real-Time Imaging of...
Reporting Period: July 1, 2015 – December 31, 2015

Information to be reported in your progress report is as follows (attach additional information as needed):

1. Summary of project accomplishments for the period just completed and plans for the coming reporting period:

We have designed, built and tested an electrical actuation device. The device produces locally concentrated, pulsed magnetic fields of up to 300 mT with 0.2 kHz actuation frequency. These parameters are sufficient to drive twin boundaries in Ni-Mn-Ga.

Next project steps include

- Producing single crystal Ni-Mn-Ga MSM elements
- Implementing MSM element with the electrical actuation device
- Demonstrating twin boundary motion with the electrical actuation device
- Designing and building an electrically driven (i.e. solid state) MSM actuator

2. Summary of budget expenditures for the period just completed (**include project burn rate**):

The expenses for July-December 2015 are summarized in Table 1.

Expense category	Amount
Salary regular	\$ 8,070.75
Student salary	\$ 7,229.22
Fringe	\$ 2,559.14
Other expense	\$ 1,773.96
Total	\$19,633.07

The remaining budget as of December 31, 2015 is \$ 55,366.93. The December 2015 spending was \$6,444. The current burn rate exceeds \$8,000.

3. Numbers of faculty and student participation resulting from the funding, including internships:

Dr. Peter Mullner

Dr. Paul Lindquist
Andrew Armstrong (MSE graduate student)
Sam Barker (ME undergraduate student)
Miranda Buttram (MSE undergraduate student)
Justina Freilich (MSE undergraduate student)
Eric Rhoads (ME undergraduate student)

4. List patents, copyrights, plant variety protection certificates received or pending:

The patent “Electrically driven magnetic shape memory apparatus” (BSU file 158) is pending and the patent “Magnetic shape memory apparatus with long stroke” (BSU file 169) is in preparation.

5. List technology licenses signed and start-up businesses created:

On November 19, 2015, Shaw Mountain Technology LLC licensed Boise State’s patent US 9,091,251 *Actuation method and apparatus, micropump, and PCR enhanced method*.

6. Status of private/industry partnerships (include enough information to judge level of engagement):

Effective January 20, 2015, Dr. Mullner registered Shaw Mountain Technology LLC (SMT, <http://www.shawmountaintechnology.com>) with the State of Idaho. SMT is a Boise-based company that produces high-quality, advanced technology. SMT’s priority is to keep product development, manufacturing and company operations located within Idaho. SMT specializes in shape memory alloys, particularly the magnetic shape memory alloy Ni-Mn-Ga, and develops various technologies within the fields of sensors, microfluidics, energy harvesters and actuators.

Starting in August 2015, SMT sponsors a senior design project at Boise State’s College of Engineering. The students are tasked to develop a self-resting power breaker based on magnetic shape memory alloys.

SMT licensed Boise State technology (BSU files 90, 96, 122, see paragraph 5) and considers licensing technology developed in this project.

7. Any other pertinent information that will indicate to the council that the project is meeting satisfactory progress.

SMT is interested in partnering on this project if continued in FY 2017.