Materials Research Society
Southern Illinois University, Carbondale Chapter

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Funding Requested: $993.17
Project Duration: March, 2017- December, 2017

EXPLORING MATERIALS TECHNOLOGY WITH A YOUNGER GENERATION OF SCIENTISTS

Introduction

The Materials Research Society (MRS) University Chapter at Southern Illinois University Carbondale (SIUC) was inaugurated in June, 2015. We hold monthly luncheon meetings during which different students (and faculty) present their research and knowledge, with feedback to and from the audience, and we also have periodic laboratory tours to familiarize students with different experimental techniques. In addition, we recently host a group of junior and senior undergraduate students whose majors are science and engineering related from Southeast Missouri State University (SEMO) for a tour through our research facilities. Exploring Materials Science and Engineering with younger generation of potential scientists is our next interest, and is the topic of this proposal.

Project definition and objectives

The goal of this project is to introduce and acquaint a younger generation of potential scientists in local middle/high schools with the field of Materials Science and Engineering. Relatively simple but stimulating and intriguing experiments will be demonstrated to excite their curiosity in Materials research, and how Advanced Materials can improve people's quality of life. Many high school graduates are not well-guided in their choice of career path. The majority of them choose their college major based on anecdotal evidence, or the advice of friends. This may result in students' mediocre performance in college, with subsequent problems including retention and student loan debt. Practical demonstration project like that proposed may aid the upcoming generation with their career choices. They will have the opportunity to ask questions, and chat with members of the Materials Research Society. This may ultimately pique their interest in pursuing a career in the field of Materials Science and Engineering.

This project will also help to uniquely publicize the Materials Research Society (MRS), and increase her impact on new student generations by educating them about Materials research, possible career options, how Materials research can improve people's quality of life. This will no doubt contribute to the growth and development of our local chapter and the MRS at large.

Project description

The project will involve a brief lecture introduction, followed by a demonstration and hands-on training with simple experiments in Material Science and Engineering. The science and theory of the experiments will be explained to the students using visual aids to improve their understanding. Some (but not all) of the experiments that will be performed are listed below:

- Electroless plating of Ag, formation of an Ag mirror
- Formation of metal trees
- Fabricating a simple battery: The Gerber cell
- Turning Cu into Au: The Alchemist's Dream

These projects will be conducted at The Science Center, located in the University Mall in Carbondale, Illinois. This is a public museum that is already equipped with most of the required equipment and familiar with safety precautions for this project. Student members of the MRS University Chapter at SIUC are already involved in demonstrations and exhibits at The Science Center. Families and children in Southern Illinois have visited The Science Center for the past 21 years, enjoying the state-of-the-art museum and science demonstrations conducted on special occasions.

Project personnel

A team of 7-10 SIUC MRS University Chapter members (MRS graduate students and faculty) and Mr. Chris Walls, Executive Director of The Science Center, and his staff will be involved in conducting the experiments and demonstration in a safe and timely manner.

Project budget

The estimated budget for this project is $993.17 and the breakdown of the budget is as given below.

S/No	Materials	Quantity (g or ml)	Unit cost ($)	Total cost ($)
1	Silver nitrate, $AgNO_3$	25g	18.55	463.76
2	Aqueous ammonia solution, NH_3	500mL	0.17	85.46
3	Sodium hydroxide, NaOH	100g	0.56	56.12
4	Nitric acid, HNO_3	500mL	0.20	101.26
5	Dextrose, $C_6H_{12}O_6$	500g	0.13	67.16
6	Florence flask and stopper	12 nos	5.02	60.27
7	Petri-Dishes	50 nos	2.04	102.00
8	Cu sheets	96oz	0.34	33.00
9	Zn powder	100g	0.24	24.14
			Total	$ 993.17

We look forward to a favourable response. Thank you very much.

Sincerely,

Hassana Samassekou, President
Sambasiva Reddy Bheemireddy, Vice Presicent
Bamidele Daniel Falola, Secretary
Hannah Giang, Treasurer
Rajesh Prabhu Balaraman, Member

MRS University Chatter
Southern Illinois University, Carbondale