

2013-2014 FACULTY GRANTS FOR INTERNATIONAL CONNECTIONS
LEHIGH UNIVERSITY - Office of International Affairs (OIA)
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PROJECT SNAPSHOT

RECEIVED

MAR 08 2013

International Affairs
Lehigh University

Host: Dr. Hartmut Polzin
Gießerei-Institut (*Foundry Institute*)
Technische Universität Bergakademie Freiberg (*Freiberg University of Mining and Technology*)
Freiberg, Saxony, Germany

Goal: The goal of this trip is to cultivate an international collaboration with Dr. Hartmut Polzin of Freiberg University of Mining and Technology, specifically aimed at pollution prevention technologies for foundries. Beyond this, University impact is expected by developing a relationship that benefits both Universities with student and scholar exchange opportunities.

Date: June, July, or August 2013

Cost: \$4,721

PROFESSIONAL GOALS

The goal of this visit is to develop research collaboration with Dr. Hartmut Polzin, his research group, and his colleagues at Freiberg University of Mining and Technology. To date, my primary research topic has focused on pollution prevention technologies for manufacturing, specifically biomaterial based foundry binders and foundry mold material recycling technologies. From a global perspective, foundries are seeking technology based solutions to meet ever-more-stringent environmental regulations. Specifically, the U.S. and Europe are leading both the environmental regulations and low-emission casting technology development efforts. The U.S. and Germany are home to the most productive foundries in the world, and are most desirous for technology based environmental solutions. Dr. Polzin's expertise in Materials Science and Engineering at the Foundry Institute, focuses on foundry mold processes and foundry mold materials. Dr. Polzin's expertise in foundry processes and my expertise in pollution prevention technologies for foundries is an excellent blending for collaboration.

TU Bergakademie Freiberg (TUBAF) is one of the oldest technical universities in the world, is home to the world's first school of mines and metallurgy. When TUBAF was founded in 1765, Freiberg had been a center of private education in mining and metallurgical engineering for several centuries. Many famous scientists, including Alexander von Humboldt, Abraham Gottlob Werner, Clemens Winkler, and others have studied at TUBAF. TU Bergakademie Freiberg is where the elements Indium and Germanium were discovered. TU Bergakademie Freiberg is one of the top 3 German Universities in research funding. Dr. Polzin's research at the TUBAF Foundry Institute has produced publications on topics including; alternative foundry mold materials for casting, inorganic foundry binders, sustainable binder systems, the production of cast profile rollers, use of modified clay materials for sorption of industrial pollutants, castings for wind power, inorganic binders for copper castings, cement sand casting, and simulation techniques for casting. These research topics provide a strong foundation for research collaboration.

EXPECTED OUTCOMES

Short-Term Outcomes: The immediate outcome will be to identify collaborative research projects focused on pollution prevention technologies for foundries, as well as to identify student and scholar exchange opportunities.

Long-Term Outcomes: The anticipated long-term outcomes include; ongoing research efforts, pursuit of internationally funded research opportunities, mutual sabbatical opportunities, student and scholar exchange, and research publications on collaborative topics.

NATURE OF INTERACTION

The trip will foster collaboration in the area of pollution prevention technologies for foundries. The visit will enable Dr. Hartmut Polzin to provide details of the research infrastructure and personnel available for collaboration within the Foundry Institute at TUBAF. I will be able to provide a research presentation at TUBAF on my research related to biomaterial based foundry binders and foundry mold material recycling technologies. The research presentation will be able to attract potential Ph.D. students to Lehigh, as well as develop research collaborations with academics pursuing foundry related research.

PRE-TRIP PREPARATION

As Dr. Polzin and I are both familiar with each other's work to date, pre-trip preparation activities will focus on exchanging ideas that can push the threshold of innovative technologies for pollution prevention technologies in foundries. Pre-trip preparation will exchange ideas and begin mapping out areas of mutual collaboration. To achieve the necessary pre-trip preparation we will have monthly conference calls, bi-weekly emails, and an exchange of papers.

FOLLOW-UP ACTIVITIES

Follow-up activities will benefit students taking CEE 373 (Fundamentals of Air Pollution) as they will gain an international perspective, by being introduced to Germany's air pollution regulations. Additionally, students from TUBAF and Lehigh will be encouraged to pursue exchange opportunities. Ongoing research collaboration will yield; research publications, research funding, and conference presentations.

PROPOSED BUDGET

The total proposed budget for the Summer 2013 visit is \$4,721. This budget includes airfare, hotel accommodations, and meals for 2 weeks. The meals and lodging rates are based on the U.S. Department of State's rate for nearby Dresden, Germany. The itemized budget is tabulated below.

Item	Cost	Number	Subtotal
Airfare (PHL to DRS)	\$1,585	1	\$1,585
Meals & IE (DoS)	\$114	14	\$1,596
Lodging (1/2 DoS Rate)	\$110	14	\$1,540
Total			\$4,721



Die Ressourcenuniversität. Seit 1765.

Gießerei-Institut



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Datum: 07.03.2013

Letter of Invitation

Dear Mr. Fox,

It's a pleasure for me to invite you at the Foundry Institute of Technical University Mining Academy Freiberg!

At your visit I will show you the opportunities of the foundry institute, especially in the area of moulding materials and processes. For me it's interesting to discuss with you the following points:

- Cooperation between our universities in the area sands, binders, moulding processes with environmentally friendly properties, environmental protection in the foundry industry
- Creation of international research projects in this field
- Exchange of scientists and students

I'm very happy to see you in Freiberg and hope that we can find a start point for a cooperation between our universities in the future.

Best regards
Mit freundlichen Grüßen und Glück auf !

Dr.-Ing. habil. Hartmut Polzin

