

## **Why Do a Graduate Degree in a Metallurgical and Materials Engineering Department?**

### **M.S. and Ph.D. Degree in Welding and Joining Sciences at the Colorado School of Mines**

by

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The metallurgical and materials engineering (MME) program at the Colorado School of Mines (CSM) offers two advanced degrees that specialize in welding science, masters of science (M.S.) and doctorate of philosophy (Ph.D.). These graduate-level programs develop the engineering and materials principles that students acquired in their undergraduate curriculum to understand the responses of materials subjected to joining. Further knowledge of joining metallurgy is gained through a series of advanced courses, including *welding metallurgy, non-fusion joining, arc plasma physics, phase transformation in metals, theory of alloying, and transport in solids*, to name a few.

The program enjoy excellent reputation that students from South America, Europe, Asia, Middle East, Japan, and America come to the MME department to further their education in welding and joining science. The major portion of the degree program at CSM involves a research project that the graduate student develops. Examples of research can range from investigating welding parameters for optimizing material performance to developing innovative welding consumables. Independent of the particular focus of study in materials, the student will develop solid understanding of how welding and joining processes affect materials and the capability of solving these problems. The presentation will be based on the perspective of Mr. Jeff Major, a current Ph.D. student that had conducted a M.S. research program at CSM.