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FOR IMMEDIATE RELEASE

US$20,000 AWARDED TO T.C. GRAHAM PRIZE AWARD WINNER

Recognizing innovative steel applications for development of new markets

PITTSBURGH, 2 October 2017 — Two researchers at the University of Rochester's Institute of Optics have been named winners of the Association for Iron & Steel Technology's (AIST) 2017 T.C. Graham Prize, an international award meant to encourage development of new and innovative uses for steel.

Chunlei Guo, professor, and Anatoliy Vorobyev, senior scientist and a team member of Guo's lab in the Institute of Optics at the University of Rochester, will share in the US$20,000 prize for their innovative laser surface-etching techniques that can imbue new properties to steel. Through the techniques that have been developed, steel surfaces can be made to either repel water, absorb water or absorb heat. These properties have a wide variety of consumer and industrial applications. Among them: easier flowing pipelines, ice-free rail tracks, reduced-drag hull plates on ships and enhanced energy storage opportunities.

Guo first began his research about 10 years ago when it was unimaginable that a metal surface would turn black without the use of paint. His research team originally asked themselves, "How much heat would deposit into a metal when a laser pulse zaps the metal surface?" While complicated, Guo and his team found that they could alter metal surfaces in a dramatic way, which eventually led to the creation of black metal, colored metal, water-wicking and water-repellent surfaces.

These properties are relevant to everyday life in the following capacities:

- Black steel will transform steel to become a solar energy absorber and expand its applications in energy.
- By diffusing liquid across it surface, water-wicking steel speeds up evaporation, which is useful in cooling applications such as process water cooling and air conditioning.
- Water-repellent steel is resistant to corrosion, icing and the buildup of mineral deposits or biological growths, such as algae. Furthermore, water-repellent steel will potentially reduce friction with liquids. These surfaces are also self-cleaning as contaminants, dirt, dust and debris are readily swept away.

Upon learning of his T.C. Graham Prize achievement, Guo said, "The award means a great deal to Anatoliy and I and to others working with me. Thinking back to our initial goal of studying fundamental interactions between laser pulses and metals, I would not have anticipated finding a real-world application capable of a profound impact. Most of us scientists would be complacent with some scientific insights we could gain from a study like that. But when I realize how much our results can make a difference to the real world, especially when this is recognized by the Association for Iron & Steel Technology, it gives me an entirely different level of fulfillment."

Guo and Vorobyev's proposal represented one of a diverse group of individual and team applicants from around the world. From that group, three finalists were ultimately selected, and Guo presented their proposals during a live video conference to the Contest Jury on 30 August 2017. During the conference, each finalist had 10 minutes to present their submission to the jury of global steel industry executives, followed by a brief question-

and-answer session.

The Contest Jury consisted of **John Brett**, president and chief executive officer, ArcelorMittal USA; **Peter Campo**, president, Gerdau Long Steel North America; **John Ferriola**, chairman, president and chief executive officer, Nucor Corp.; **Mark Millett**, president and chief executive officer, Steel Dynamics Inc.; and **Roger Newport**, chief executive officer, AK Steel.

For more information regarding the T.C. Graham Prize, please visit the T.C. Graham Prize webpage.

AIST is a non-profit technical association of 17,500 members from 70 countries, with the mission to advance the technical development, production, processing and application of iron and steel. The organization is recognized as a global leader in networking, education and sustainability programs for advancing iron and steel technology.

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