



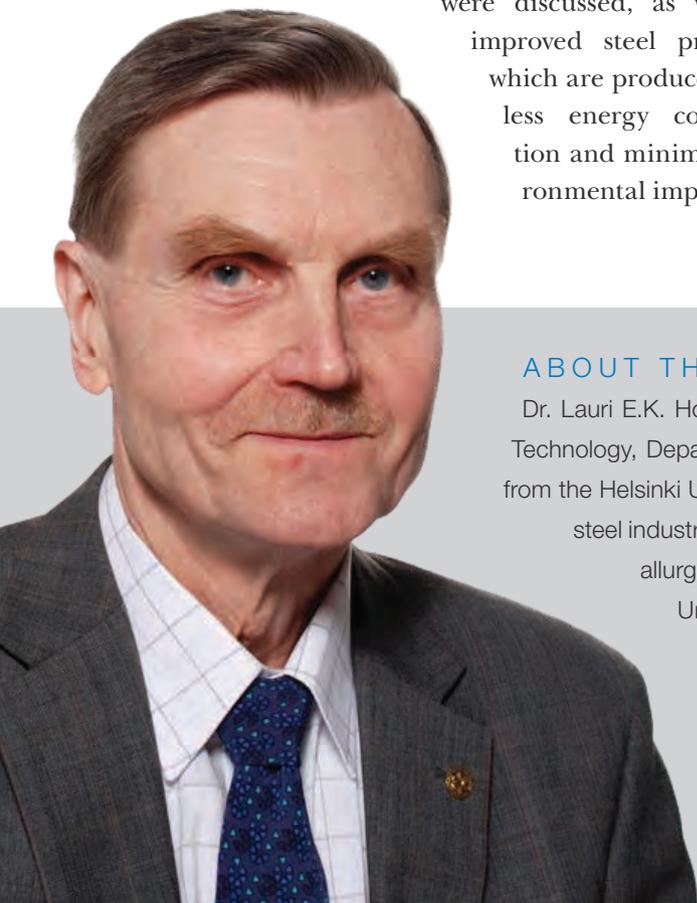
## DR. LAURI E.K. HOLAPPA COMPLETES THE AIST 2012 ELLIOTT LECTURE SERIES

### Recent Advances and Challenges of Chemical Process Metallurgy



“When I was a student in the 1960s, Elliott was a literary master via the book, *Thermochemistry for Steelmaking*. In the following decades, I even had the opportunity to meet him at conferences and to learn about his lectures. When preparing my lecture, I found it difficult to incorporate different metals in my presentation, as John often did. My lecture concerned principally the following topics, although the main emphasis was varied in order to take into account the students’ curricula.

“First, a short introduction to the background of the John F. Elliott lecture and AIST was given. Then the growth of global metals production and the role of metals in our lives were reviewed. Examples of recent developments in steel production technologies were discussed, as well as improved steel products, which are produced with less energy consumption and minimal environmental impact.



Dr. Lauri Holappa, professor emeritus at Aalto University, Finland, completed a tour of universities with his 2012 Elliott Lecture, which was titled “Recent Advances and Challenges of Chemical Process Metallurgy.” The tour included four universities in the Great Lakes region in the U.S. and Canada:

- **MONDAY, 7 APRIL 2014**  
Carnegie Mellon University  
Pittsburgh, Pa., USA  
*hosted by Prof. Chris Pistorius*
- **TUESDAY, 8 APRIL 2014**  
McGill University  
Montreal, Que., Canada  
*hosted by professors In-Ho Jung and Rod Guthrie*
- **WEDNESDAY, 9 APRIL 2014**  
Queen’s University  
Kingston, Ont., Canada  
*hosted by Prof. Christopher Pickles*
- **THURSDAY, 10 APRIL 2014**  
University of Toronto  
Toronto, Ont., Canada  
*hosted by professors Alex McLean and Mansoor Barati*

### ABOUT THE SPEAKER

Dr. Lauri E.K. Holappa is professor emeritus at Aalto University School of Chemical Technology, Department of Materials Science and Engineering. He received his D.Sc. from the Helsinki University of Technology in 1970 and then spent nine years within the steel industry conducting and managing research, with his last years as chief metallurgist. In 1979, he was appointed professor of metallurgy at the Helsinki University of Technology, and beginning in 1980 he acted as head of the department for six years. He has graduated 26 doctoral and about 150 master’s students and has acted as opponent or examiner for about 30 doctoral students in other universities worldwide. He has served as alderman of the Guild of Mining and Metallurgy Students for more than 25 years. He has written approximately 400



*Prof. Holappa's (front row, right) lecture at McGill University was hosted by In-Ho Jung (second row, left) and Rod Guthrie (front row, left).*



*Karim Danaei (right), doctoral student at the University of Toronto, gave a short demonstration of an inductively coupled plasma mass spectrometer to Prof. Holappa (left).*

“As to the future challenges of steel metallurgy, the main endeavors are still directed toward reduction and elimination of environmental issues by developing clean technologies, by minimizing the use of fossil fuels and non-renewable energy and by intensifying recycling. Another key factor is to create new, innovative steels with much improved properties and thus radically increase the output/input ratio. This is possible by developing novel steel grades, and by applying new strengthening mechanisms and processing methods. Steel refining and casting are key processes concerning, e.g., steel cleanliness, control of inclusions and precipitates and solidification structure. A broad understanding of chemical metallurgy, including thermodynamics, kinetic phenomena, interfacial phenomena, phase transformations, etc., is of central importance in current and future process development. Mastering of non-metallic inclusions in steels as

a means to improve steel properties was discussed as an example.

“At the end of the lecture, I briefly introduced my own

university, Aalto University, which was formed in 2010 by merging the Helsinki University of Technology, Helsinki School of Economics and School of Art and Design to ‘a new university where science and art meet technology and business.’

“The lectures were generally scheduled during a student seminar week, gathering 30–50 participants. Students even took part in lively debate on the lecture topics. The lecture tour was an excellent opportunity for me to become acquainted with these famous universities. Three of them (CMU, McGill, UofT) have very strong groups focused on process metallurgy. Queen’s University has its emphasis in mining education and research, but it is planning to revitalize its chemical metallurgy curriculum.” ♦

articles, conference papers or reports, including about 250 international publications. His research and teaching have been focused on physical co-chemical principles of metallurgical processes and how to apply fundamental knowledge in the development of industrial processes, e.g., iron- and steelmaking, casting, and pyrometallurgical processes for copper, nickel, cobalt and ferrochrome. Dr. Holappa was awarded the Eero Mäkinen commemorative medal of the Finnish Association of Mining and Metallurgical Engineers in 2008. He remains active in the international community of metallurgists.

## ABOUT THE ELLIOTT LECTURE

The AIST John F. Elliott Lectureship was established in 1990. This honorary lectureship is designed to acquaint students and engineers with the exciting opportunities in chemical process metallurgy; inspire them to pursue careers in this field; inform the public of the contributions of chemical process metallurgy and materials chemistry to the association; and honor the late Professor John Elliott of the Massachusetts Institute of Technology for his many accomplishments and the leadership that he provided during his career.