

### September Dinner Meeting Recap

#### September Meeting Recap – James Derksen

ASM Edmonton hosted its 6th annual student night on September 29. We had three speakers from NAIT and three with university backgrounds. All of them had interesting stories of their lives and their choices to join the materials community. It was incredible to see the passion from them which became a running theme. Everyone who spoke mentioned the word and their passion for what they've found in the Materials community. Every speaker talked about why they chose Materials and more importantly why they had stayed in it. It is always a great experience hearing the story of how people get involved and ASM is a huge part of that community. I would really like to thank all the volunteers especially the student representatives Raeanne Moore and Daniel Fujinaga for their work.

[Visit our website for photos from Student Night 2016!](#)

If you have any ideas for future technical speakers or topic, please don't hesitate to contact us at [ASM.Edmonton@gmail.com](mailto:ASM.Edmonton@gmail.com)

### October 2016 Event

#### ASM Dinner Meeting

For the next ASM technical dinner meeting of the season, ASM Edmonton will be welcoming Dr. Linruo Zhao who will be speaking on *historical perspective on the evolution of high-temperature materials and processing technologies for aircraft engines*.

#### Abstract

Nature "Over his existence man has developed equipment to satisfy his needs." – *Chester T. Sims, General Electric Company*.

Modern aircraft engines present some of the most challenging working environments for metallic materials – the temperature of combustion gas entering the turbine exceeds the melting point of the white hot rotating blade alloy! From the conception of high-temperature materials based on austenitic stainless steels in the 1930s to the latest generation of single crystal Ni-base superalloys used in Rolls-Royce Trent 1000 engines, we have come a long way as metallurgists to understand the science and master the art of crafting some of the best-behaved materials in the engineering field. In this talk the author will briefly walk the audience through a historical journey and make a few stops at such milestones as the discovery of the precipitation hardening gamma prime phase in early 1940, the additions of refractory metals for solid solution strengthening of the gamma phase from late 1940s, the advent of vacuum melting of superalloys around 1950, the introduction of directional solidification process to produce columnar and single crystal airfoil components in the 1960s and 1970s, and the development of the fifth generation single crystal Ni-base superalloy in the 2000s. Furthermore, the application of thermal barrier coatings on internally cooled components in the 1970s has enabled engineers to design gas turbines with combustion gas temperatures exceeding the melting point of superalloys used in

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### Upcoming Events

**Technical Dinner Meeting – Linruo Zhao**  
Thursday, October 27th, 2016  
Location: Faculty Club, University of Alberta

**Technical Dinner Meeting – Pieter Visagie**  
Wednesday November 26, 2016  
Location: Faculty Club, University of Alberta

the engines. Looking at the horizon, the emergence of ceramic matrix composites is challenging the legitimacy of Ni-base superalloys in gas turbine engines to achieve still higher efficiencies.

### Biography

Dr. Linruo Zhao is the Principal Research Officer with the Aerospace Portfolio of the National Research Council of Canada. He earned his Ph.D. in Physical Metallurgy from Beijing Institute of Aeronautical Materials in 1988. After spending two years at the University of Manitoba as a postdoctoral fellow, Dr. Zhao joined the Institute for Aerospace Research of the NRC in 1991.

His early work at the NRC concentrated on the processing, microstructure and mechanical properties of high-temperature materials for gas turbines. In the last 10-15 years, he focused most of his research on the design, fabrication and evaluation of protective coatings for aircraft engine components. Dr. Zhao has authored and co-authored more than 100 papers in scientific journals and conference proceedings. He joined ASM International in 1991 and has been active in serving his local Ottawa Valley Chapter. He currently is the vice-chair of ASM Canada Council.

### Price and Registry:

\$30 for members of the affiliated societies (ASM, AWS, NACE, CWS, SME and CSME);

\$10 for students;

\$40 for non-members.

Register RSVP at

<http://asm-edmonton-october2016.eventbrite.com>

(Note: Eventbrite adds a small surcharge)

### Dates and Times:

Date: Thursday, October 27th, 2016

Location: Faculty Club, University of Alberta,  
11435 Saskatchewan Drive

### Schedule:

Registration 6:00 PM

Dinner 6:30 PM

Program 7:30 PM

For further questions, contact [asm.edmonton@gmail.com](mailto:asm.edmonton@gmail.com)

### Feedback

The ASM Edmonton Executive is continually working to improve this newsletter in order to better serve our members. If you have any suggestions or comments regarding the newsletter or if you would like anything included please contact us [here](#).

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