The Minerals, Metals and Materials Technology Centre (M3TC) was established within the Faculty of Engineering at the National University of Singapore (NUS) in 2006, with generous financial support from the Singapore Economic Development Board (EDB) and NUS. Our mission is to contribute to the development of local and regional enterprises and industries active in the minerals, metals and materials sectors. Leveraging on the extensive and globally recognized expertise of over 300 faculty members in ten engineering disciplines, our goal is to assist industry and businesses in enhancing their technology via strategic R&D projects with M3TC.

Aside from R&D, M3TC also performs manpower training in Singapore in areas of interest to the sectors noted earlier. This is accomplished by organizing workshops, short courses and hosting relevant symposia of interest to industry. Results of our research are also disseminated via participation in international conferences and publication in peer-reviewed journals. M3TC has received much global visibility and recognition. I am pleased to add here that we have established close links with a number of esteemed institutions around the world in the mining and minerals processing areas, which is beneficial in enhancing the scope and quality of our R&D.

If you are interested to find out more about any of the Centre’s projects, please feel free to contact the Principal Investigators or M3TC office for details. We welcome inquiries from industry and businesses for potential consulting and/or joint R&D projects. We can also assist in designing tailor-made professional development courses or manpower training in selected areas for the minerals and metals industry.

We plan to issue a newsletter on a quarterly basis to keep our partners in academia as well as industry and government posted with the progress as well as outcomes from our R&D effort at M3TC. Our website of course will continually be updated with more details. Readers may contact me or Dr Jeremy Lease for information about M3TC. Queries on specific projects may be addressed to the academic faculty members who conduct the research of interest. Please note that, in view of the vast variety of expertise resident within our Faculty of Engineering at NUS, please do not hesitate to contact us should you wish to explore collaborative R&D possibilities in the mining, mineral and materials processing areas.

Professor Arun S Mujumdar
NUS, Singapore
**Completed Projects**

- **Development of Futuristic Tin-based Materials as New Generation Electronic Solders**
  - Contact: Prof. Manoj Gupta, Mechanical Engineering, NUS
  - Email: mpegm@nus.edu.sg

- **Metal/Mineral Nanocatalysts for Synthesis of Methanol from Coal**
  - Contact: Prof. Zeng Hua Chun, Chemical and Biomolecular Engineering, NUS
  - Email: chezhc@nus.edu.sg

- **Mathematical Modeling of Important Technological Processes in Mineral, Metal and Materials Processing**
  - Contact: Prof. Arun S Mujumdar, Mechanical Engineering, NUS
  - Email: mpeasm@nus.edu.sg

- **Impact and Morphing Properties of Smart Fibre Metal Laminate**
  - Contact: Prof. Quek Ser Tong, Civil Engineering, NUS
  - Email: ceeqst@nus.edu.sg

- **Development of Manufacturing Capabilities for High Quality Cost Effective Structural Composites**
  - Contact: Prof. Tay Tong Earn, Mechanical Engineering, NUS
  - Email: mpetaye@nus.edu.sg

- **Advanced Processing for Powder Metallurgy (P/M) - High Performance and Cost Effective Materials**
  - Contact: Prof. Jerry Fuh, Mechanical Engineering, NUS

- **Removing Natural Organic Matters (NOM) by Integrated Coagulation-Membrane System with Natural Iron Sand**
  - Contact: Prof. Hu Jiangyong, Environmental Science and Engineering, NUS
  - Email: ceehujy@nus.edu.sg

- **Capturing of Carbon Dioxide in Liquid Magnesium for Developing Enhanced Performance Materials**
  - Contact: Prof. Manoj Gupta, Mechanical Engineering, NUS
  - Email: mpegm@nus.edu.sg

**M3TC updates**

- Dr. Jeremy Lease named programme manager to look after management of M3TC office, EDA liaison, operational functions and liaison with PIs

- Steering committee met on August 5, 2011. A number of valuable suggestions exchanged which will be implemented in the next few months.

- Mr. Cavan is now a office-in-charge of M3TC at EDB which initiated the establishment of M3TC at NUS in 2007.

- New staff in M3TC office: Ms Claire Lee (Senior Executive); Mrs. Norizan Abdul Majid (Management Assistant Officer) and Ms. Lina Gosali (Senior Executive)

- Professor Arun S Mujumdar has been nominated by the Board of the Scientific Council of University of Lyon I, Lyon, France, to receive Doctor Honoris Causa (Honorary Doctorate). The formal function will be held later in 2011.

- Director of Rusnas PEBT of Sriwijaya University, Palembang, Indonesia, Dr. M. Faizal, hosted two M3TC researchers on a very informative field trip to Palembang, Indonesia.

- Dr. Sachin and Mr. Hafiiz visited a coal mining project at Tanjung Enim, South Sumatera, Indonesia and also delivered a talk on M3TC activities in Sriwijaya University, Palembang.
**Ongoing Projects**

Coal Gasification for Clean Energy Research  
Contact: Prof. Wang Chi-Hwa, Chemical and Bio-molecular Engineering, NUS  
Email: chewch@nus.edu.sg

Development of a Cost–Effective and Energy Efficient Technique for Drying of Low Rank Coal (LRC)  
Contact: Prof. Arun Mujumdar, Mechanical Engineering, NUS  
Email: mpeasm@nus.edu.sg

Development of New Hydrothermal Technology for Producing Biochar for Direct Co-combustion with Coal  
Contact: Prof. Rajasekhar Balasubramanian, Environmental Science and Engineering, NUS  
Email: eserbala@nus.edu.sg

Mathematical Multi-Scale Framework for Total Air-Conditioning in Mines  
Contact: Dr. Karl Erik Birgersson, Chemical and Bio-molecular Engineering, NUS  
Email: chebke@nus.edu.sg

High-grade Activated Carbon from Low Rank Coal  
Contact: Prof. Ng Kim Choon, Mechanical Engineering, NUS  
Email: mpengkc@nus.edu.sg

A Novel Approach for Recovery of Copper and Precious Metals from Low-grade Ores Using a Combination of Microbial Oxidation and Bioleaching Techniques  
Contact: Prof. Rajasekhar Balasubramanian, Environmental Science and Engineering, NUS  
Email: eserbala@nus.edu.sg

Feasibility Studies of Underground Coal Mining in Indonesia  
Contact: Prof. Leung Chun Fai, Civil Engineering, NUS  
Email: ceelsy@nus.edu.sg

Use of Modeling and Simulation Tools for Development of an Efficient Mine Ventilation System – Control of Dust and Methane Related Hazards in Coal Mines  
Contact: Prof. Arun S. Mujumdar, Mechanical Engineering, NUS  
Email: mpeasm@nus.edu.sg

**Recent workshops/seminars**

Techno-Economic Evaluation (TEE) and Life Cycle Assessment (LCA) of processes  
By Dr. Nawshad Haque  
CSIRO, Australia  
August 03, 2011

Workshop on Mathematical Modeling of Transport Processes  
NUS, Singapore  
April 09, 2011

Bioethanol production in Brazil: Advances and Challenges  
By Prof. Maria A Silva  
UNICAMP, Brazil  
March 01, 2011

Workshop on Planning and Design for Ground Control in Underground Coal Mines  
By Prof. Yoginder Chugh  
University of Southern Illinois, USA  
June 29-30, 2010

**Upcoming events**

One-day workshop on Industrial Drying Technologies-Principles & Practice  
Venue: NUS, Singapore

One-day workshop on Design and Modeling of Underground Ventilation System  
Venue: NUS, Singapore

**New Projects**

A New Integrated Coal Prospecting Tool for SE Asia: A Remote Sensing and Geophysical Approach  
Contact: Prof. David Higgitt, Geography, NUS

Understanding, Testing and Enhancing Mineralized Nanofluid Stability  
Contact: Dr Saif A Khan, Chemical and Biomolecular Engineering, NUS  
Email: chesakk@nus.edu.sg

**Contact Details**

Ms Claire Lee (Senior Executive) - englctc@nus.edu.sg
Dr. Jeremy D. Lease (Programme Manager) - mpejsl@nus.edu.sg

Website - www.eng.nus.edu.sg/m3tc

Professor Arun S Mujumdar (Director) - mpeasm@nus.edu.sg
Website - www.serve.me.nus.edu.sg/arun
Recent Publications


H. Osman, S.V. Jangam, J.D. Lease, and A.S. Mujumdar. Drying of low-rank coal (LRC) - a review of recent patents and innovations. Drying Technology (accepted for publication).


