IRADSTM2025 Annual Meeting

Presidential Talk

Role of Academia-Industry (A-I) on Drying Science and Technology

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Outline of Presentation

- Why A-I is Essential in the Development of Technologies.
- ASM's Personal Experience / Perspective on A-I
- Goals of A-I: How New Breakthrough Technologies Can Be Transferred to Industry Through A-I.
- Key Hurdles in Implementing A-I
- Academia Produce Inclusive Research, the Industry Often Needs Exclusive Academia for Development and Profits
- Closing Remarks

Why A – I ?

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- Scientific and technical knowledge is growing exponentially. Accessing/digesting relevant knowledge is not cost-effective for most industries.
- Science-based, innovative ideas can be scaled up and applied in practice.
- Academia benefits from industry feedback to direct research to “real-world” problems.
- Industry can access advanced analytical and computational tools more commonly available in academia at a lower cost and with fewer new employees.
- Manpower training via industrial interaction is an important by-product.

ASM's Personal Experience / Perspective on A-I:

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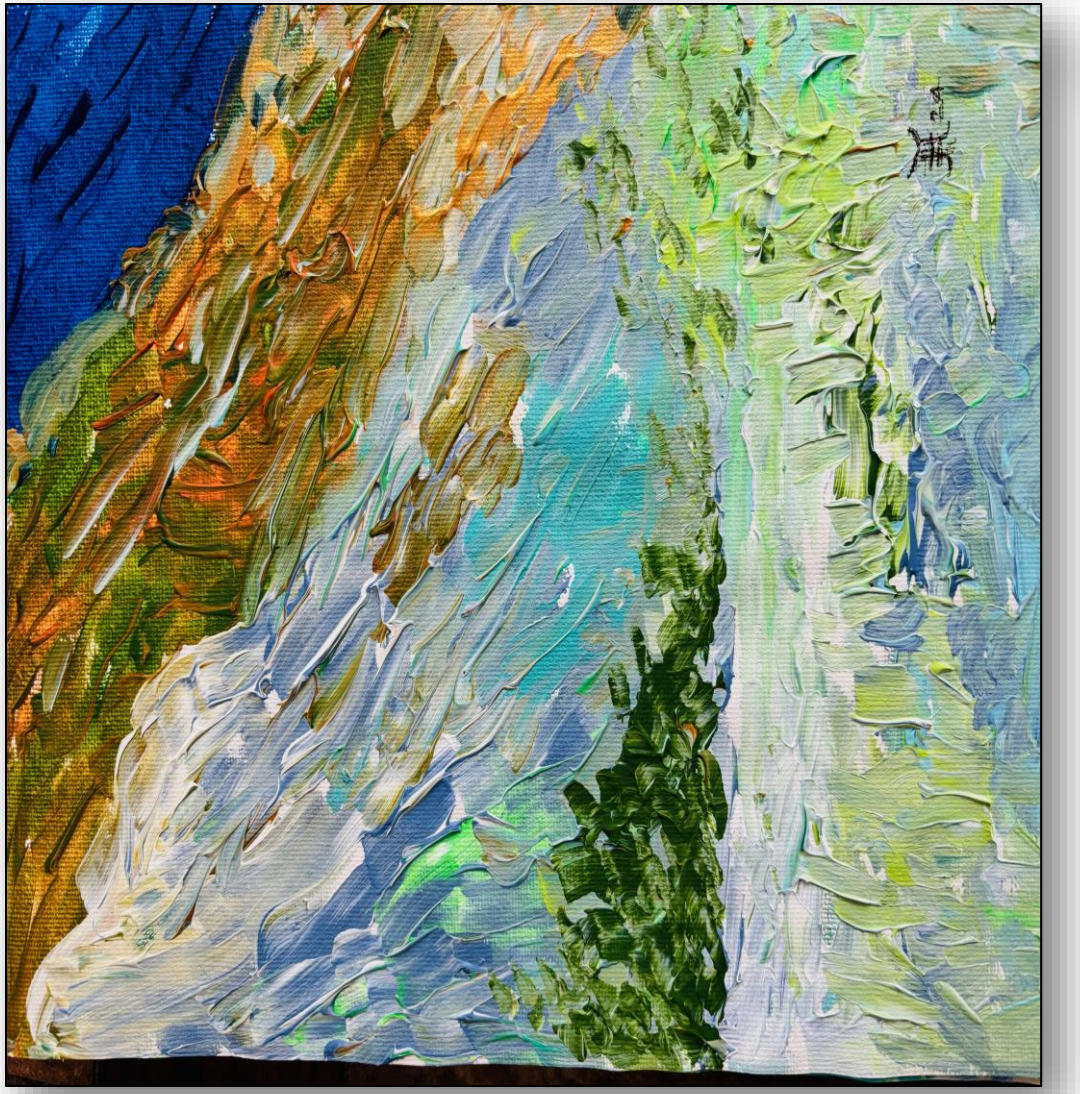
- Perspective based on over 50 years of interaction with industry in Canada, USA, India, Finland, Japan, Australia, etc. Dealt with Fortune 100 companies as well as startups.
- Most projects resulted in higher productivity, greater sustainability, optimized operations, higher energy savings, better product quality, selection of better equipment, etc.
- Training of industry professionals was an important by-product.
- Funding from the consultation helped research projects at the university.
- Innovative dryer ideas were tested/implemented/published.
- Covered many industrial sectors – many problems are similar.

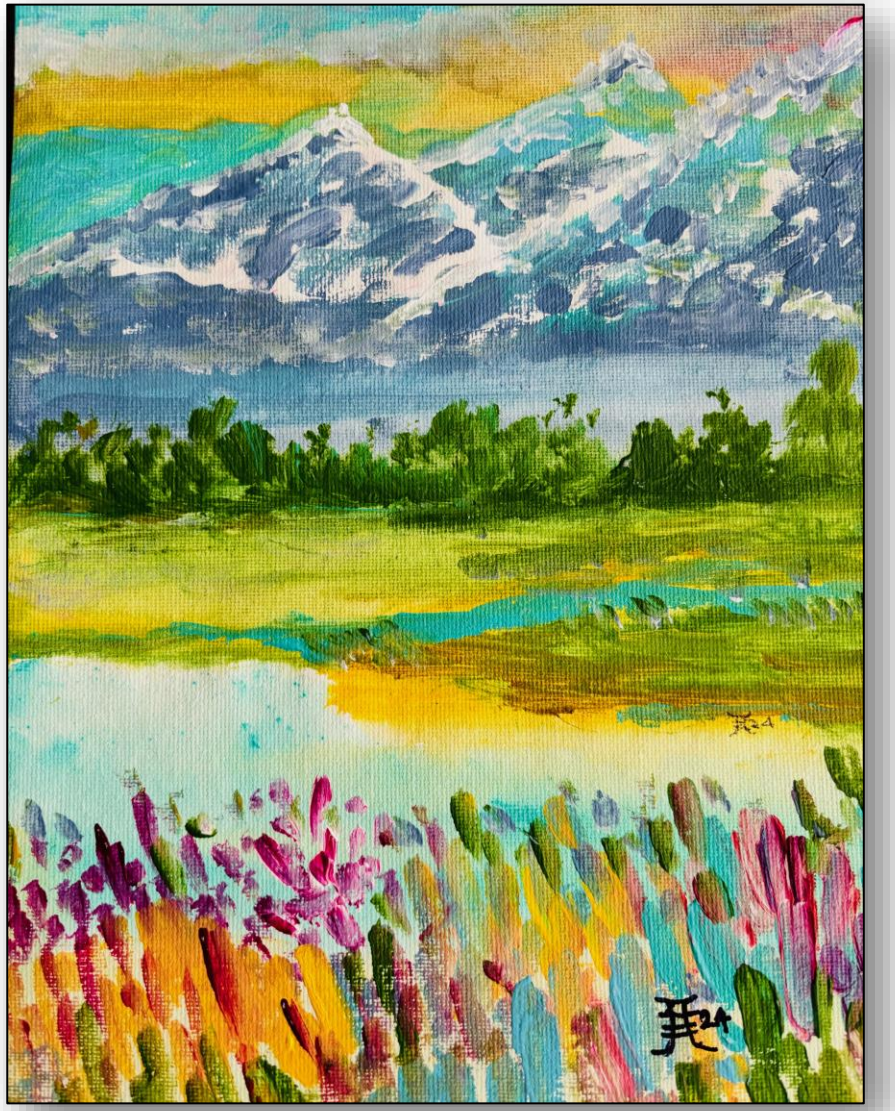
Goals of A-I



Goals of A-I

- Enhance the productivity of “R” in Academia and Cost-Effective Development “D” in industry.
- Sharing of talent and limited research funds reduces the “net cost” of R&D.
- A-I internation has higher innovation potential.
- Some industry contracts led to the definition of generic research projects of broad interest, which were published.
- Note: The proprietary nature of most consulting projects does not allow naming companies.

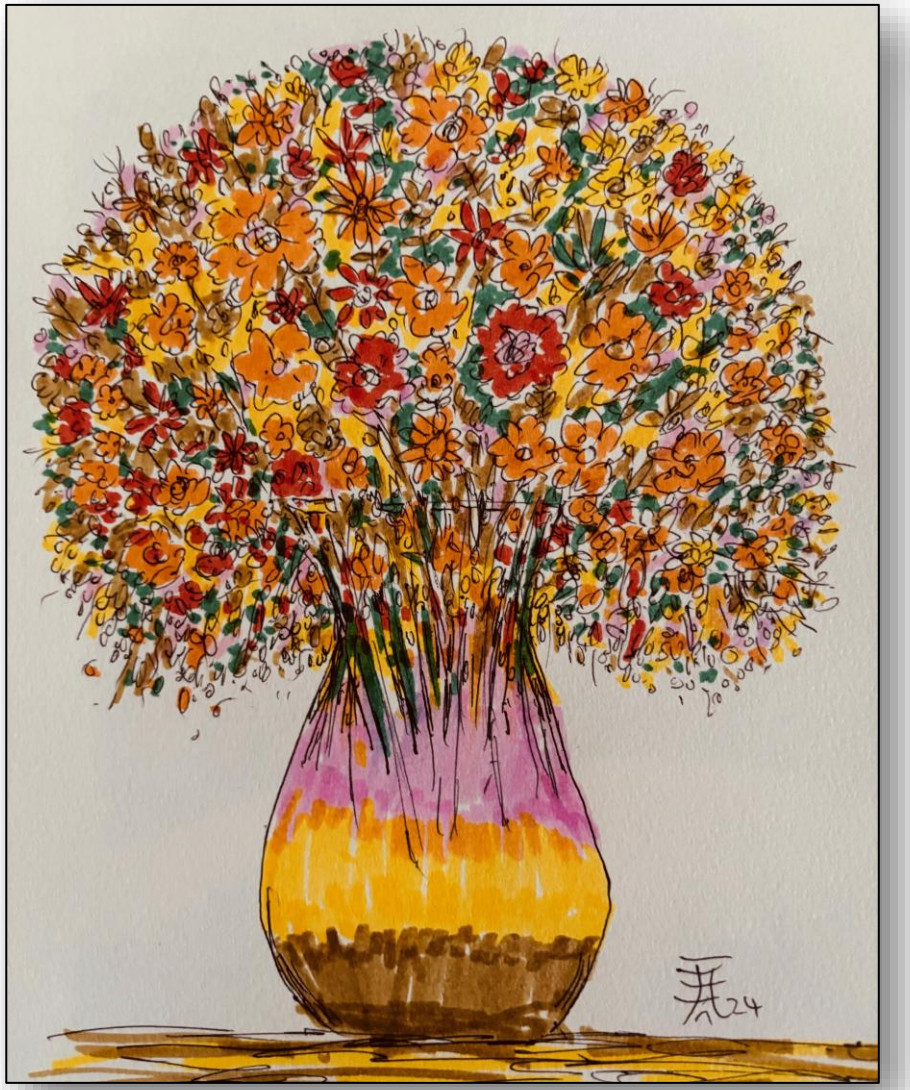
How New Breakthrough Technologies Can Be Transferred to Industry Through A-I..?



Tech Transfer Through A-I

- Less Frequent Occurrence.
- Higher returns are possible but at higher risk, hence harder to implement.
- Personal experience – superheated steam dryer for paper developed over a period of a decade; pilot-tested by an overseas company. Not commercialized due to a radical change of the drying system and some serious problems with the implementation of the mechanical design.
- Novel paper drying technologies developed by five different groups were never put into practice despite the A-I effort.

Key Hurdles in Implementing A-I



Key Hurdles in Implementing A-I

- In general, difficult to design A-I projects due to the divergent interests of A and I.
- Academic R is non-profit oriented; New Knowledge is created to share globally after vetting by peers.
- Industrial R&D is necessarily profit-oriented and hence not commonly published.
- Academic research output is usually “slow,” while industry needs are more urgent – matching time scales is a frequent problem.

Closing Remarks

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- Despite limitations, it is important to develop closer A-I links for mutual benefit.
- Personal experience shows some countries and some companies are good at A-I R&D and are advancing faster technologically as well as scientifically, e.g., China.
- Sharing IP is a major issue, although only about 2% of patents are actually used in industry.
- Academics rarely made large profits from patents – there are rare exceptions. Still, IP is a critical roadblock.
- Finally, we will see more AI coupled A-I in future industrial development.

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-- Prof. Arun S. Mujumdar

Thank You...!!

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