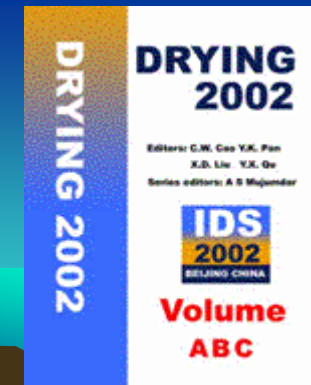
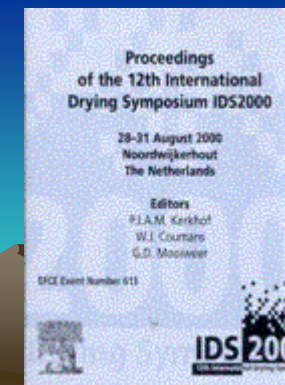
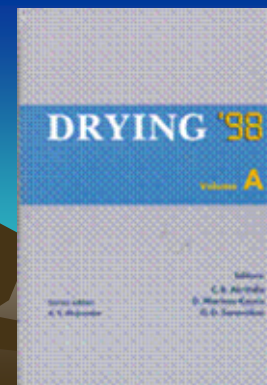
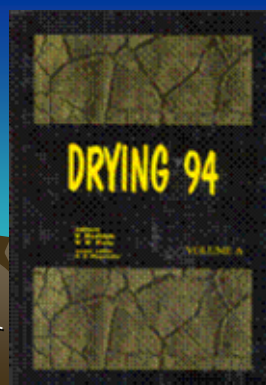
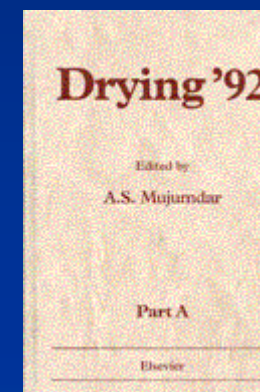
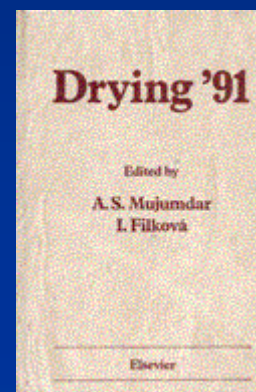
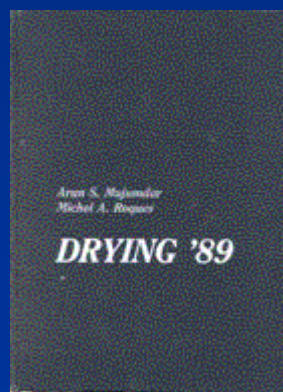
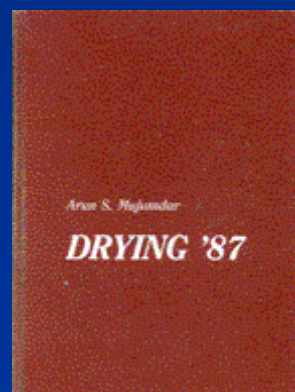
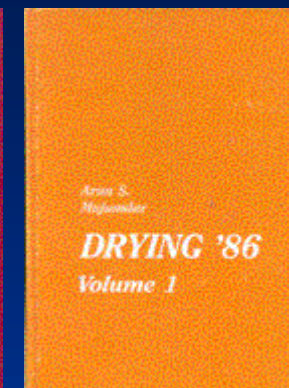
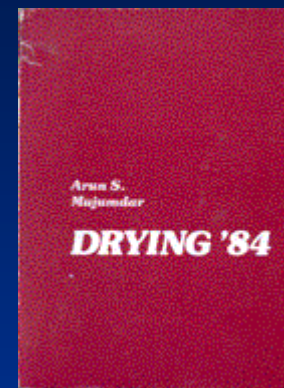
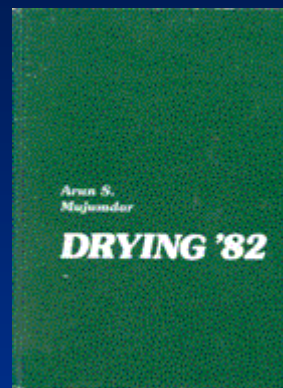
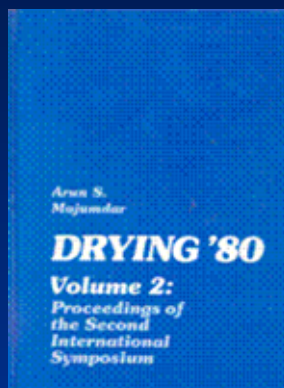


Research Contributions of Professor Arun S. Mujumdar, NUS, Singapore



Research Contributions of Professor Arun S. Mujumdar

Topics:

- Industrial heat/mass transfer / drying / dewatering
- Fundamental research – heat transfer / fluid mechanics

Visit www.geocities.com/AS_Mujumdar for details

*Research Methodology: fundamental approach;
mission-oriented, experimental, analytical,
computational*

Drying – Areas of Research 1972 -

- Paper Drying:
 - Impinging jets to moving, permeable Surfaces
 - Effects of large ΔT ; cross-flow; multiple jets; suction
 - Unsteady, noncircular, multiple jets

Drying – Areas of Research 1972 - (continued)

- Particulate / slurry drying: vibrated beds, agitated fluid beds, spouted beds (2-D, rotating/oscillating jets; noncircular draft-tubes etc.); impinging streams, etc.
- Models: Yankee drying of structured tissue paper; heat pump drying, multi-mode, intermittent drying
- Other: Electro-osmotic dewatering; PCM-storage to conserve energy; sonochemical decontamination, microwave drying, etc.

Fundamentals: Transport Phenomena

- Drying: Diffusion models; multi-mode time-varying heat input
- Heat transfer: multi-PCM, melting/freezing heat transfer, application in micro-electronics cooling
 - Explosive boiling; high superheat metastable boiling phenomena for application to micro-actuators
 - Opposing jets; stability
 - Impinging jets on noncircular jets
 - Pulse combustion drying

New Areas Initiated in Recent Years

- Transport phenomena in biomedical engineering; computational fluid dynamics and heat transfer modeling
- New electronic cooling applications for micro-electronics
- Sonochemical reactions for decontamination of organics in water

For Research Publications visit:

www.geocities.com/AS_Mujumdar

Acknowledgements: Research publications based on research effort supervised, primarily by Professor Mujumdar at McGill University (1972-2000) and NUS (2000-), of 30+ postdoctoral researchers, 40+ Ph.D. students, 30+ M.Eng. students and over 110 B.Eng. students as well as over 10 international research collaborations.

Current Research in Heat and Mass Transfer Group

Professor Arun S. Mujumdar



Mechanical Engineering Department

Note: Names of collaborators from NUS / elsewhere are omitted for clarity.

See www.geocities.com/AS_Mujumdar for a detailed listing

New

Explosive Boiling
Micro-Scale Heat
Transfer

Heat and
Mass Transfer

New

Sonochemical Reactions
for decontamination of
water

Fundamental

Applied

Single Phase

Gas-Particle Systems

Turbulence models

Gas-Particle Flow

Non-Newtonian
Impinging Jets

Opposing Jets

Noncirculating
Jet Impingement

Impinging Jets

Opposing Jets for
Mixing

Flows in Dryers

Modeling

Drying

Spray Drying

Heat Pump
Drying

Spouted Beds

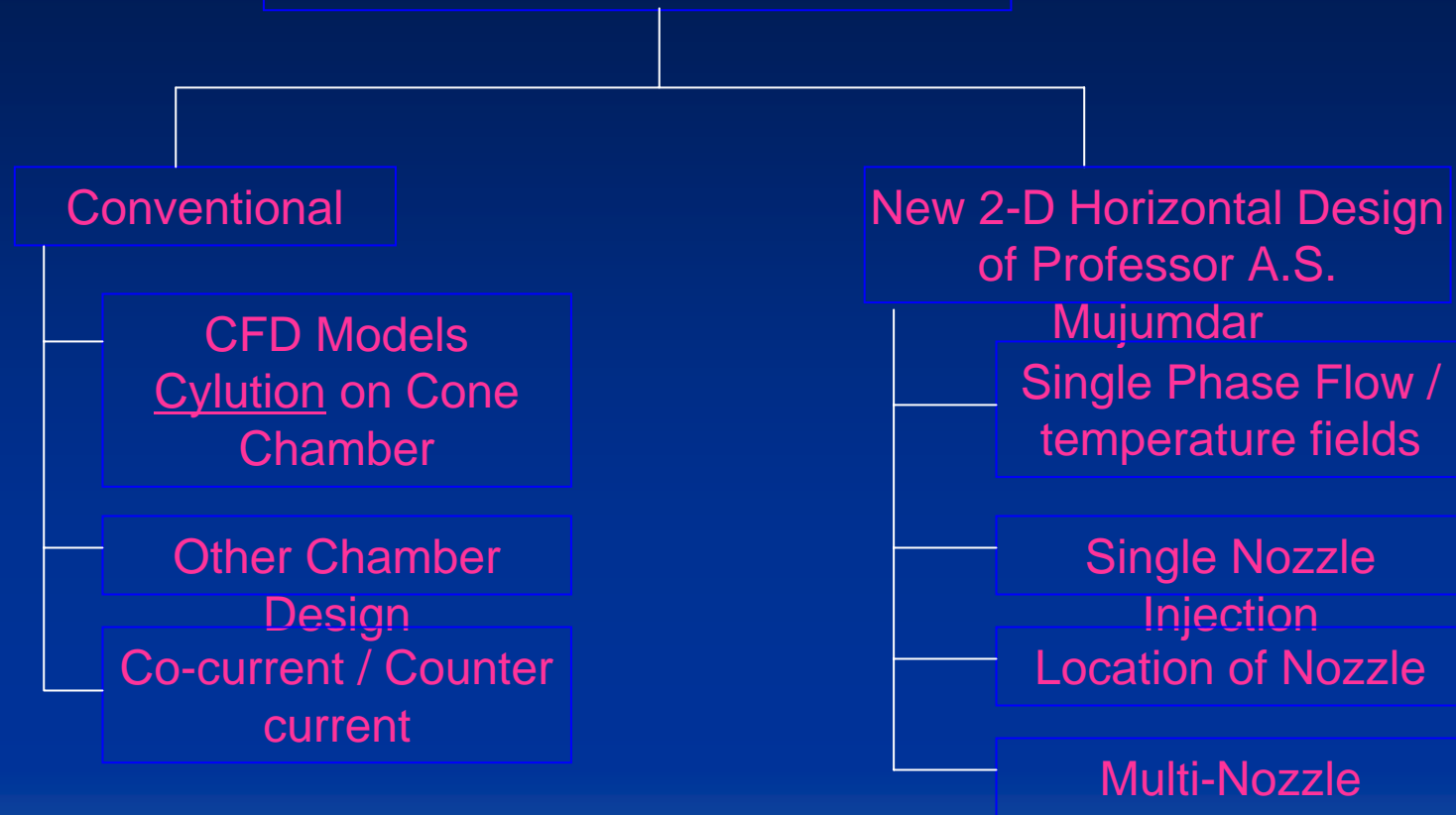
Gas-Particle
Impinging Jets

Low Pressure
Steam Drying

Gas-Particle
Opposing Jets

Osmotic
Dehydration
Atomization

Spray Drying Modeling

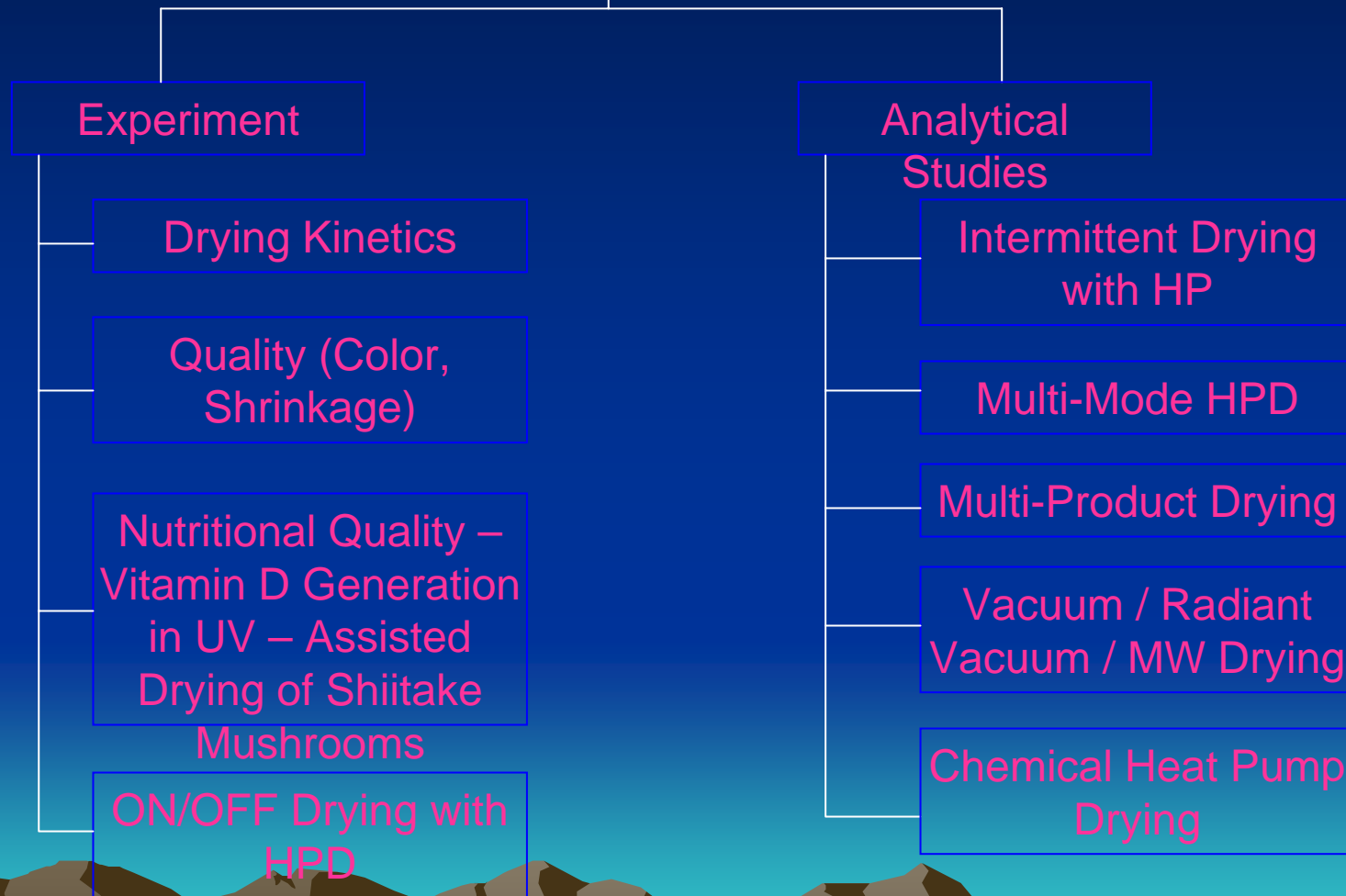


Focus on CFD Modeling. Data from collaborators of overseas universities

PROFESSOR ARUN S. MUJUMDAR – OTHER PROFESSIONAL ACTIVITIES

- ❑ Editor-in-Chief: **Drying Technology – An International Journal** (10 issues per year, 200+ papers proud annually)
- ❑ **Handbook of Industrial Drying**, 3rd Edition, Marcel Dekke Inc. New York, USA (Due out in 2004), 60 Chapter, 21 Authored or co-authored by Professor A.S. Mujumdar.
- ❑ **Handbook of Postharvest Technology**, Ed. A.S. Mujumdar et al. Marcel Dekke Inc. New York, USA (January 2003) – Published
- ❑ **Drying of Product of Biological Origin**, Ed. A.S. Mujumdar, Science Publishers, Inc., Enfield, NH, USA (Publishing in late 2003 or early 2004)
- ❑ **Conference on Drying**: IDS '2004, Sao Paolo, Brazil; ADC '2003, Bangkok; NDC '2003, Copenhagen, Denmark; IWS ID '2004 Mumbai, India; Drying Workshops (several).

Heat Pump-Assistant Drying



Flow & Heat Transfer in Impinging Slot Jets

Laminar Regime

Effect of Fluid Prandtl Number

Effect of Large ΔT

Different Gases and Liquids as Jet Fluids

Turbulent Regime

Various Turbulence Models

Effect of Cross-Flow

Effect of Prandtl Number

Effect of Particle-Loading (Two-Phase Flow)