

Haiku on Glass

Dr. Shanmugavelayutham Kamakshi Sundaram—aka “S.K.” or “Shan” or “Sundaram”— is an Inamori Professor of Materials Science and Engineering at Alfred University, haiku poet, columnist, and a literary writer.

Glass Bakery

Silica, boron
Alumina, soda, lime
Chalcogen, heat ... quench



Entropy

Excess entropy
Too fast to hold together...
Boson peak appears!



Order

Order-disorder?
Spanning short-range to long-range...
What about mid-range?



Disorder

Crystals just happen.
Chaos to disorder is...
a glass transition.



Bridge

Oxygen questions
To bridge or not to bridge now?
Over viscous flow



Nucleation

Small perturbations
Some energy lost and gained...
Nuclei is born!

Relaxation

Energy landscape
Stretching in three directions...
Stay local for now.



Fluidity

Cannot see the flow
of neither mountain nor glass
But Deborah knew!



Fragility

Long, short, soft, viscous
Strong, brittle, tough, and fragile
It's all in one glass!



Break

To shard or dice
Heat, anneal, or quench, temper...
Then, which way to break?

