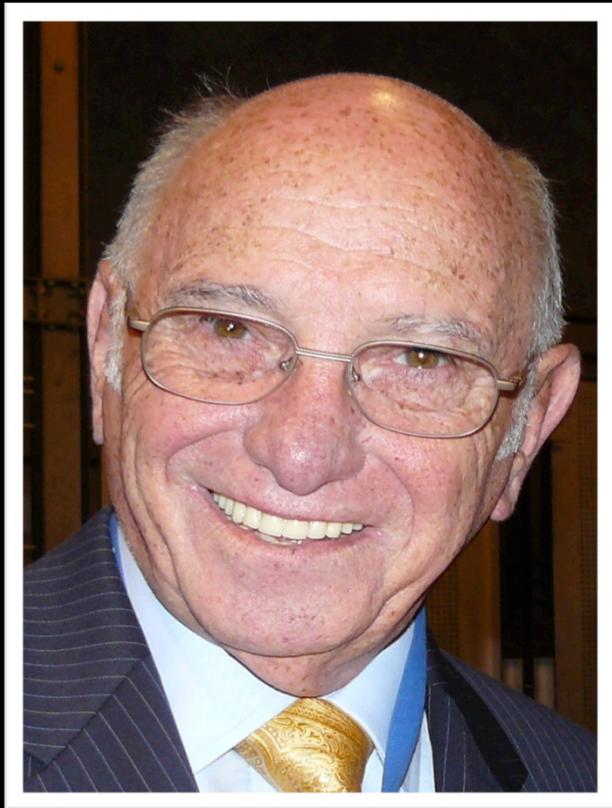


Bernie Laub
(1939 – 2013)



Sensei & a Story Teller

- BS, Aeronautical Engineering, New York University 1961
- MS, Aeronautics and Astronautics, New York University, 1963
- Avco Systems Division (1963- 1973)
Key contributor to the development of the heatshield on the Apollo
- May 1973-October 2000. Aerotherm Corporation
Vice President, Technical Operations
Managed several major projects under the Strategic Defense Initiative
- October 2000 - 2013 NASA Ames
To lead the effort to re-establishing NASA's capabilities in ablative TPS
Mentored the next generation of researchers in ablative TPS all across NASA
Winner of the 2013 AIAA Thermophysics Award

Summary

B.Laub to the NASA Advisory Council Aeronautics Committee
(October, 2006)

- The ablative TPS community is a shadow of what existed 20-30 years ago
 - Materials developers/suppliers
 - TPS technologists (analysis, modeling, testing)
 - The experience/expertise has been disappearing
 - TPS requirements for Exploration missions are NASA-unique and require a NASA-internal infrastructure
- Existing ablative TPS materials adequate for some Exploration missions (LEO, Lunar Return, Mars entry)
- New ablative TPS required for more challenging missions (Mars Return, planetary probes)
 - A few candidate materials; very few developers/suppliers
- NASA needs to rebuild it's capabilities in ablative TPS (in the spirit of Apollo)

Ablative TPS Community in the 60s and 70s



**Large community: Apollo, Viking, Pioneer-Venus, Galileo
Also significant leverage from DoD Ballistic Missile Programs**

The Shrinking Ablative Community

80's



90's



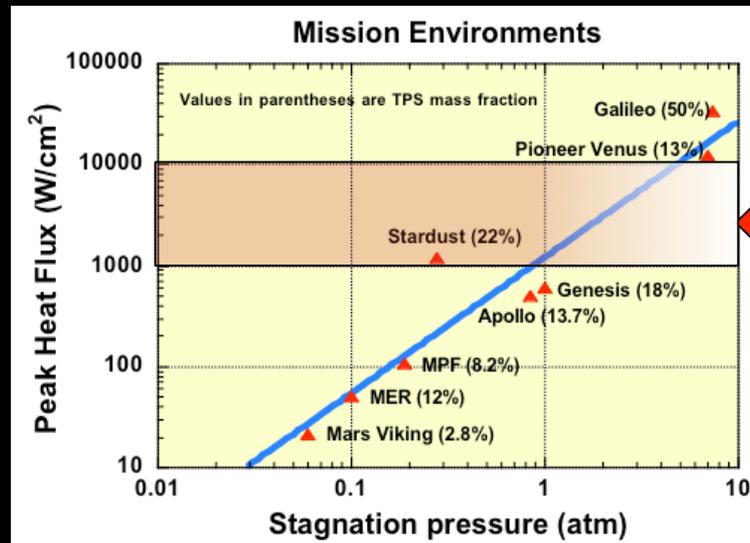
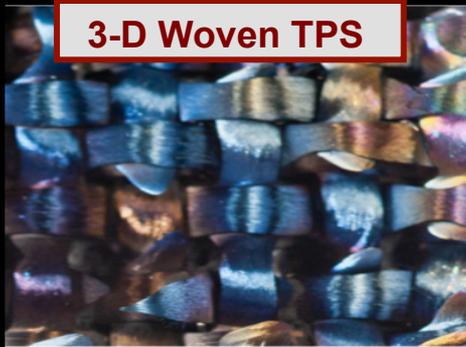
2000

Time is not
our friend!!

Turning Things Around 2000 -2007



The "Kids" Did Pretty Well



They are Getting Ready to Fill the Gap



**Thanks Bernie for everything !
You will not be Forgotten**

