Cooled Carbon Heat Exchangers

ESLI Technology Overview

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Incorporated 1980 in California; President: T R Knowles, PhD
25 Employees, $2M annual sales

FOCUS	Materials research and development for energy and aerospace
CUSTOMERS	DOD, DOE, NASA, NSF, NIH and aerospace primes
R&D FACILITIES	13,000 sqft of laboratory and office space

CORE ACTIVITIES

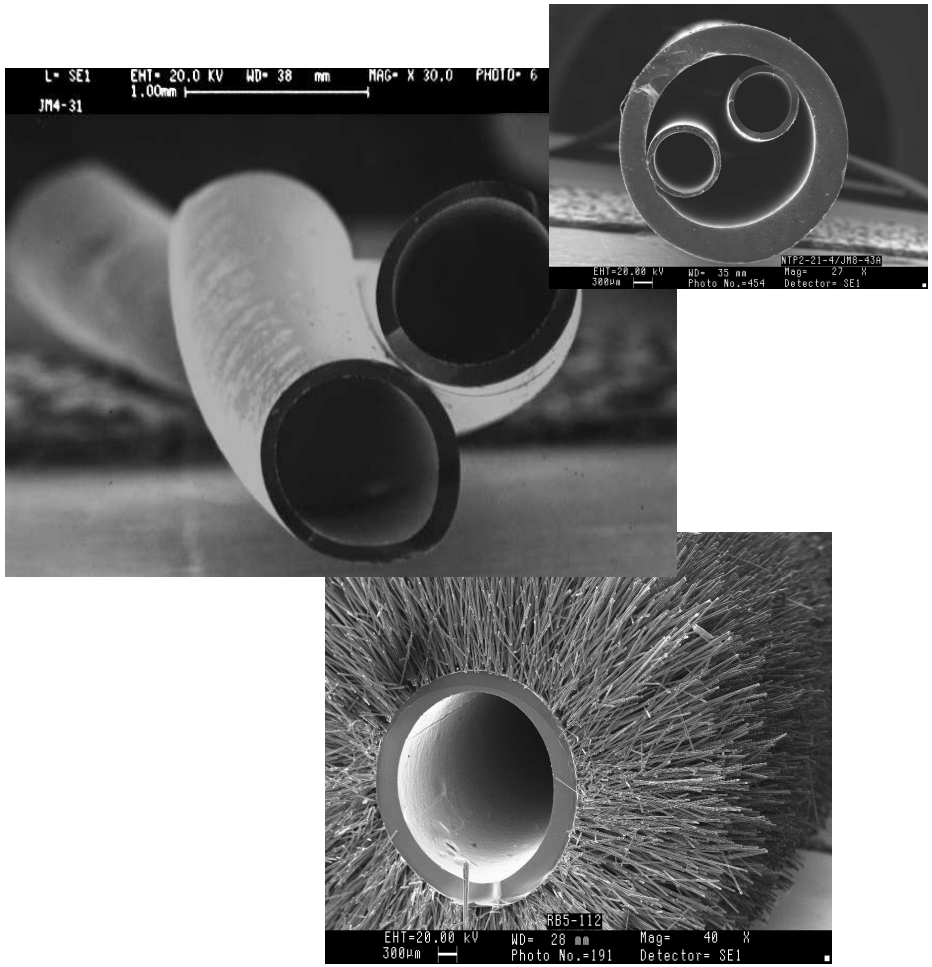
LIGHTWEIGHT STRUCTURES
NONMETALLIC HEAT EXCHANGERS
PHASE-CHANGE COMPOSITE THERMAL STORAGE
COMPLIANT THERMAL INTERFACES
TRANSVERSE FIBER REINFORCEMENTS

SPIN OFF COMPANIES

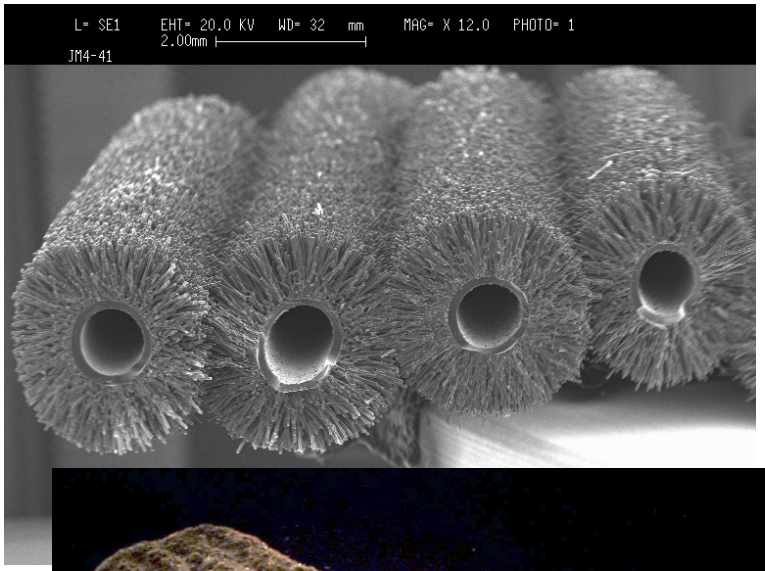
D-STAR LABORATORIES (Bend, OR) Director: J R Clinton, PhD	***THERMAL SENSORS, BOLOMETERS***
INNOVA LABORATORIES (San Diego, CA) Director: G W Webb, PhD	***MICROWAVE INSTRUMENTATION***
TETHER APPLICATIONS (Chula Vista, CA) Director: J A Carroll	***SPACE TETHER DEPLOYERS***

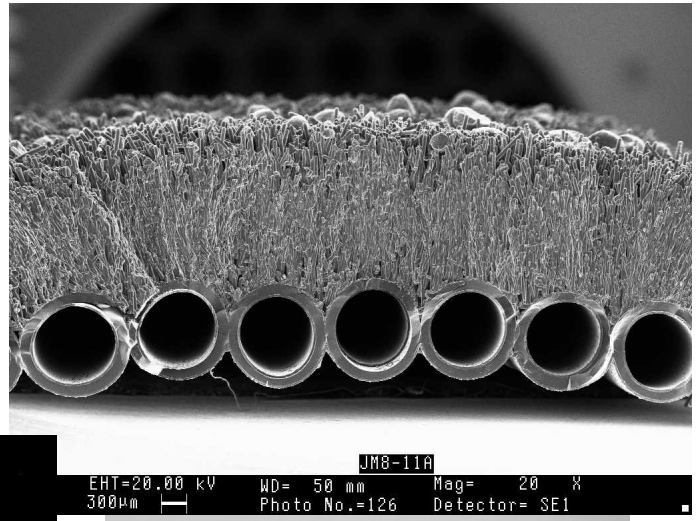
Carbon Tubing & Fintubing

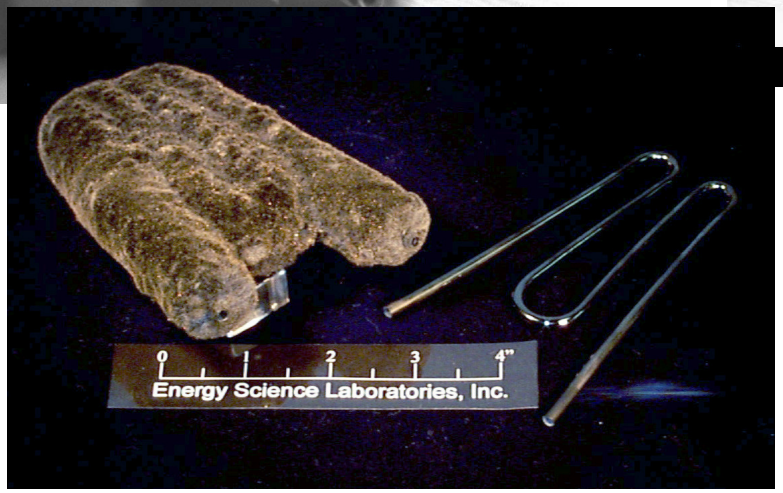
- Amorphous Carbon
  - Nonpermeable
  - High radial heat transfer
  - Low mass
  - High temperature
  - Radiation resistant
  - Thermal expansion matches silicon

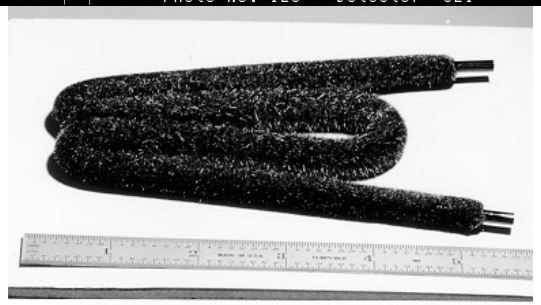


Cooled Fintube Structures









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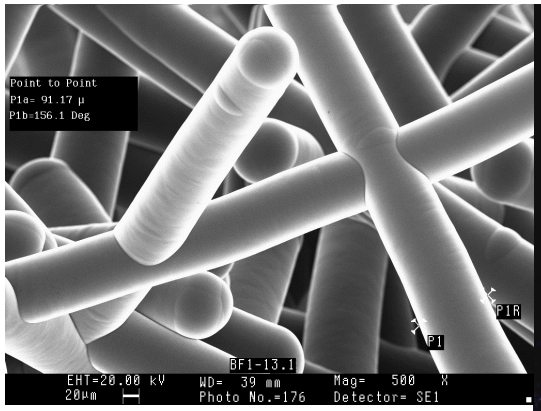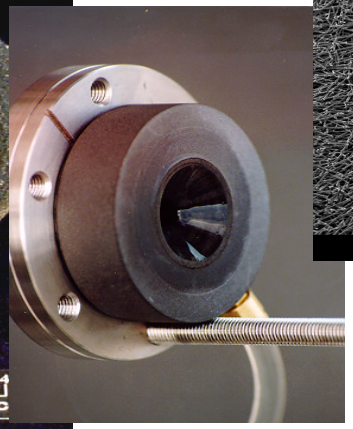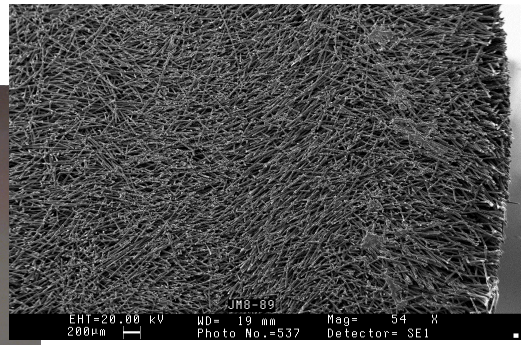
- Micro-truss material
  - Lightweight: ~5% carbon, 95% void
  - High strength/weight
  - Tailored conductivity: Conducting or Insulating
  - Vibration attentuation