NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

OFFICE OF BIOLOGICAL AND PHYSICAL RESEARCH (OBPR)

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NASA OBPR

- NASA'S MISSION IS TO:
  - UNDERSTAND AND PROTECT OUR HOME PLANET
  - EXPLORE THE UNIVERSE AND SEARCH FOR LIFE
  - INSPIRE THE NEXT GENERATION OF EXPLORERS

- NASA AND THE OFFICE OF BIOLOGICAL AND PHYSICAL RESEARCH (OBPR) BRING TO INTERAGENCY COLLABORATION:
  - DIVERSE FIELDS OF RESEARCH IN PHYSICAL AND LIFE SCIENCES NOW CHARGED WITH THE MANDATE OF SUPPORTING LONG TERM, CREWED EXPLORATION MISSIONS
  - COMPETITIVE RESEARCH ANNOUNCEMENTS INCLUDING LIFE SUPPORT AND ENVIRONMENTAL MONITORING TECHNOLOGIES, HEALTH RESEARCH AND COUNTERMEASURES/RISK MITIGATION, RADIATION MONITORING, AND AUTONOMOUS MEDICINE.
  - POTENTIAL COLLABORATION WITH NASA IN THE USE OF TECHNICAL RESOURCES
  - WHERE COLLABORATIVE RESEARCH ADVANCES NASA'S EXPLORATION AGENDA, RESEARCH IN VARIABLE GRAVITY OR MICROGRAVITY, SIMULATED OR THROUGH SPACEFLIGHT

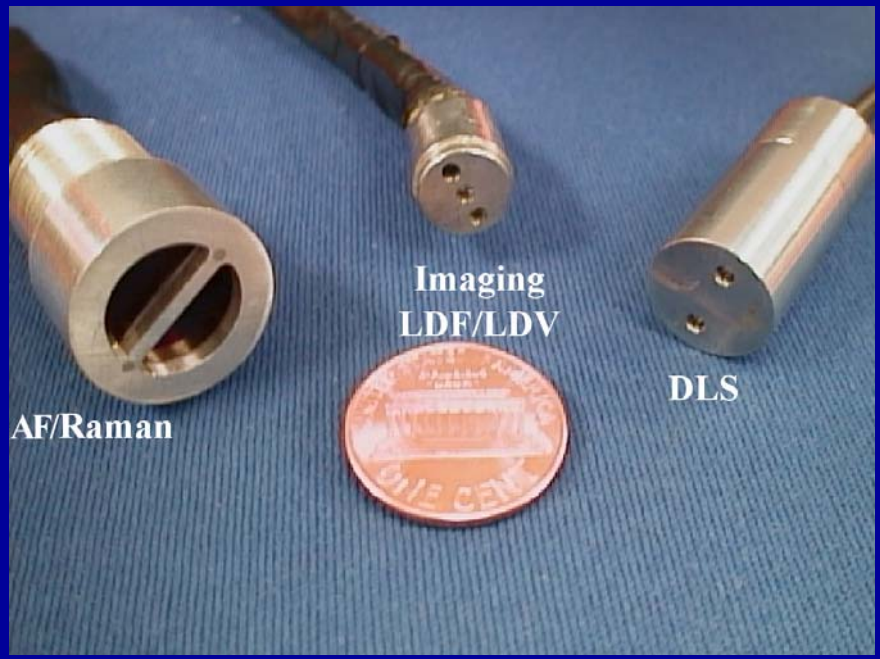
NASA OBPR

- OPPORTUNITY FOR PHYSICAL/LIFE SCIENCE RESEARCH AT THE INTERFACE
  - **OFFICE OF BIOLOGICAL AND PHYSICAL RESEARCH IS EVOLVING RESEARCH THRUSTS INTO THREE MAJOR AREAS:**
    - **HUMAN HEALTH**
    - **RADIATION SUPPORT**
    - **HUMAN LIFE SUPPORT TECHNOLOGIES**
- TOP ISSUES/CHALLENGES FOR INTERAGENCY COLLABORATION
  - **EVOLVING AGENCY GOALS AND STRATEGIC PLANS ARE BOTH CHALLENGES AND OPPORTUNITIES**
    - **A CHALLENGE TO MAINTAIN RESEARCH LINKS WITH PARTNERS DURING EVOLUTION IN AGENCY DIRECTION**
    - **AN OPPORTUNITY TO ENGAGE CURRENT AND ATTRACT NEW PARTNERS**
  - **EFFECTIVE COMMUNICATION/COLLABORATION AMONG RESEARCH AGENCIES ENGAGED IN PARALLEL RESEARCH AT A LEVEL OF AWARENESS THAT SPANS DISCRETE PROJECTS**
- RECOMMENDED ACTION
  - **CONTINUED SUPPORT FOR INTERAGENCY WORKING GROUPS AT THE HQ LEVEL TO SPAN RESEARCH DISCIPLINES, OPTIMIZE RESOURCES**
  - **ONGOING SELECTION(S) OF PROJECTS, BOTH REGIONAL AND NATIONAL, THAT ADDRESS INDIVIDUAL AGENCY MANDATES WHILE ADVANCING BROAD FIELDS OF RESEARCH**

NEI-NASA Inter-Agency Agreement

NASA Dynamic Light Scattering Technology

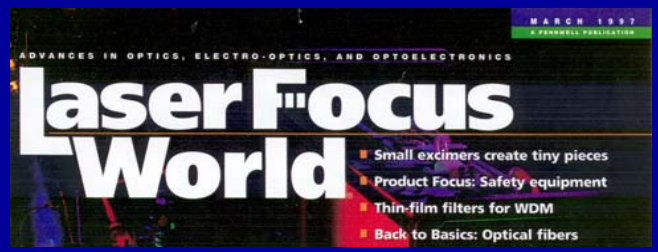
- Diagnose diseases non-invasively long before the clinical symptoms appear and help find non-surgical countermeasures
- Manuel B. Datiles III, M.D., National Eye Institute – N.I.H.
- Rafat R. Ansari, Ph.D., NASA Glenn Research Center



Conventional DLS Systems

- Large in size
- Tedious optical alignment
- Moving parts
- Index matching fluid
- Dilute solutions
- Poor signal/noise
- Require large power
- Long data acquisition times
- Not modular in design
- Not suitable for on-line applications

NASA-Developed DLS Eye Diagnostics Device in Clinical Use at NEI/NIH



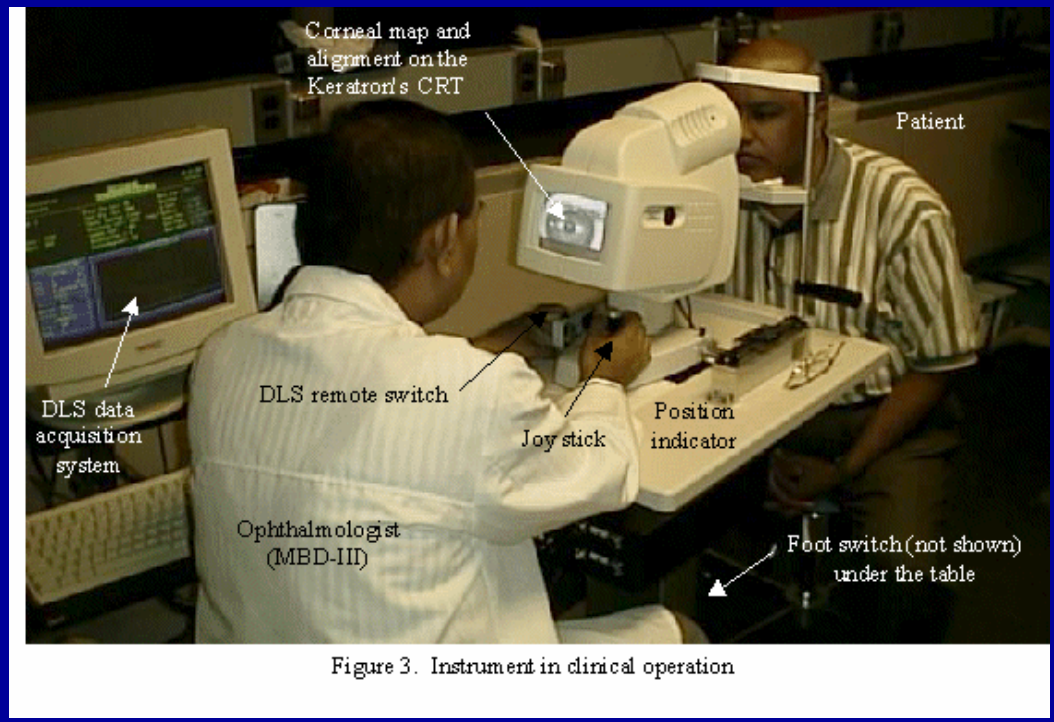


Figure 3. Instrument in clinical operation

~3 orders of magnitude more sensitive

Future Technology, 1996