

# LABORATORY for TERRESTRIAL PHYSICS



“To understand the nature, dynamics and evolution of the terrestrial ecosystem, the solid Earth and planets through the development and use of remote sensing technologies, field measurements and modeling”

**Code YS Site Visit, March 16, 2004**

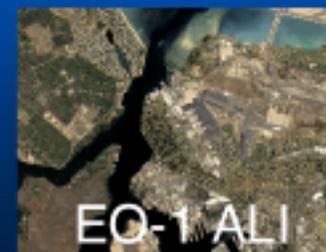
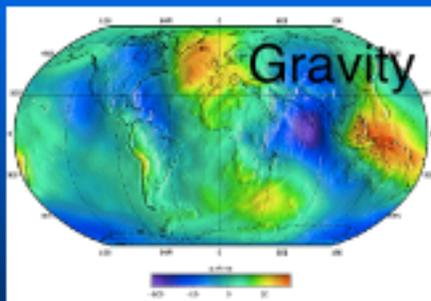
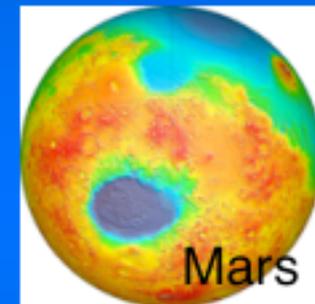


# LABORATORY for TERRESTRIAL PHYSICS

## Research Areas

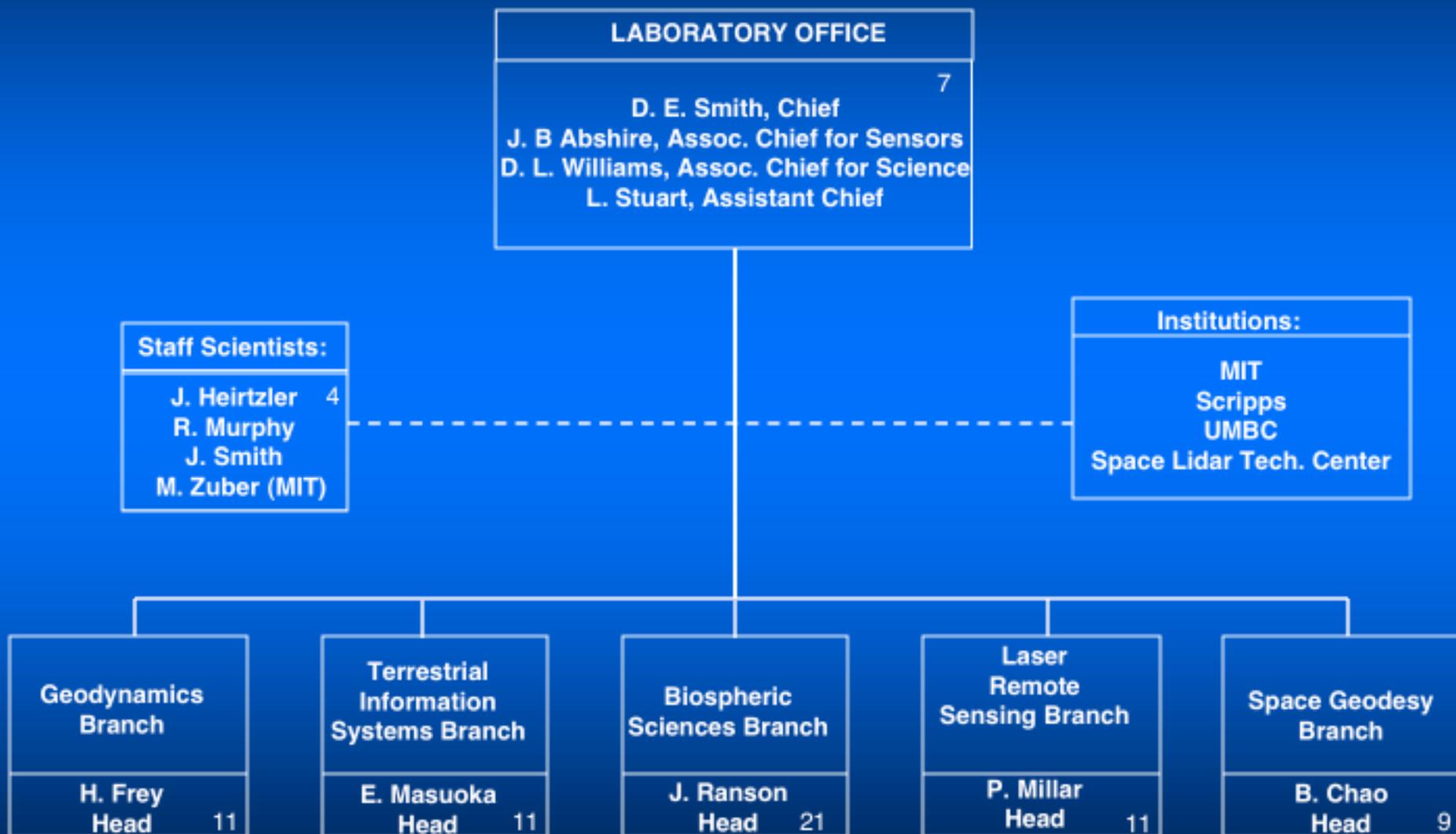


- Biospheric science
- Laser remote sensing
- Geophysical science
- Planetary science
- Data Systems





# LABORATORY for TERRESTRIAL PHYSICS

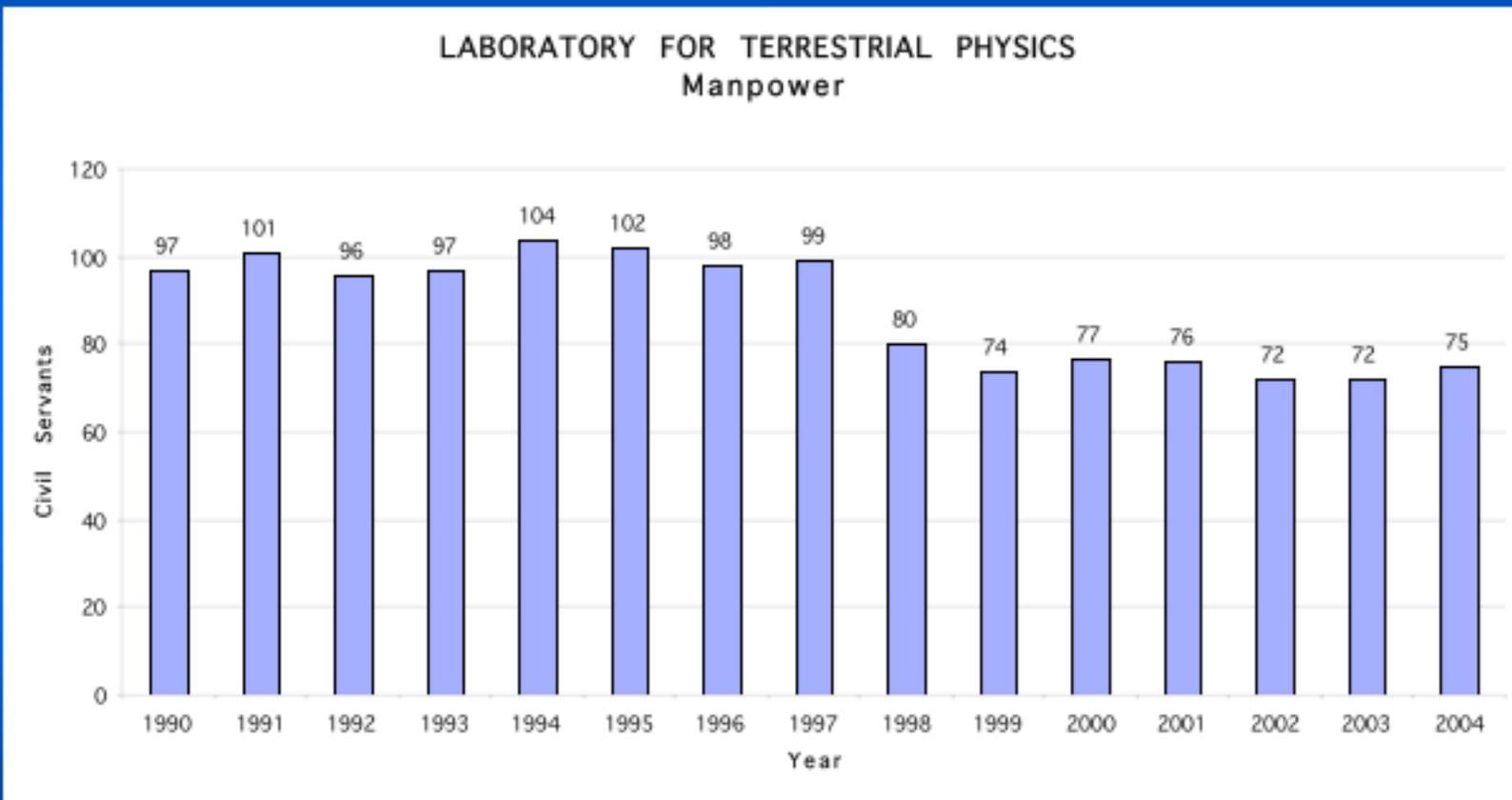




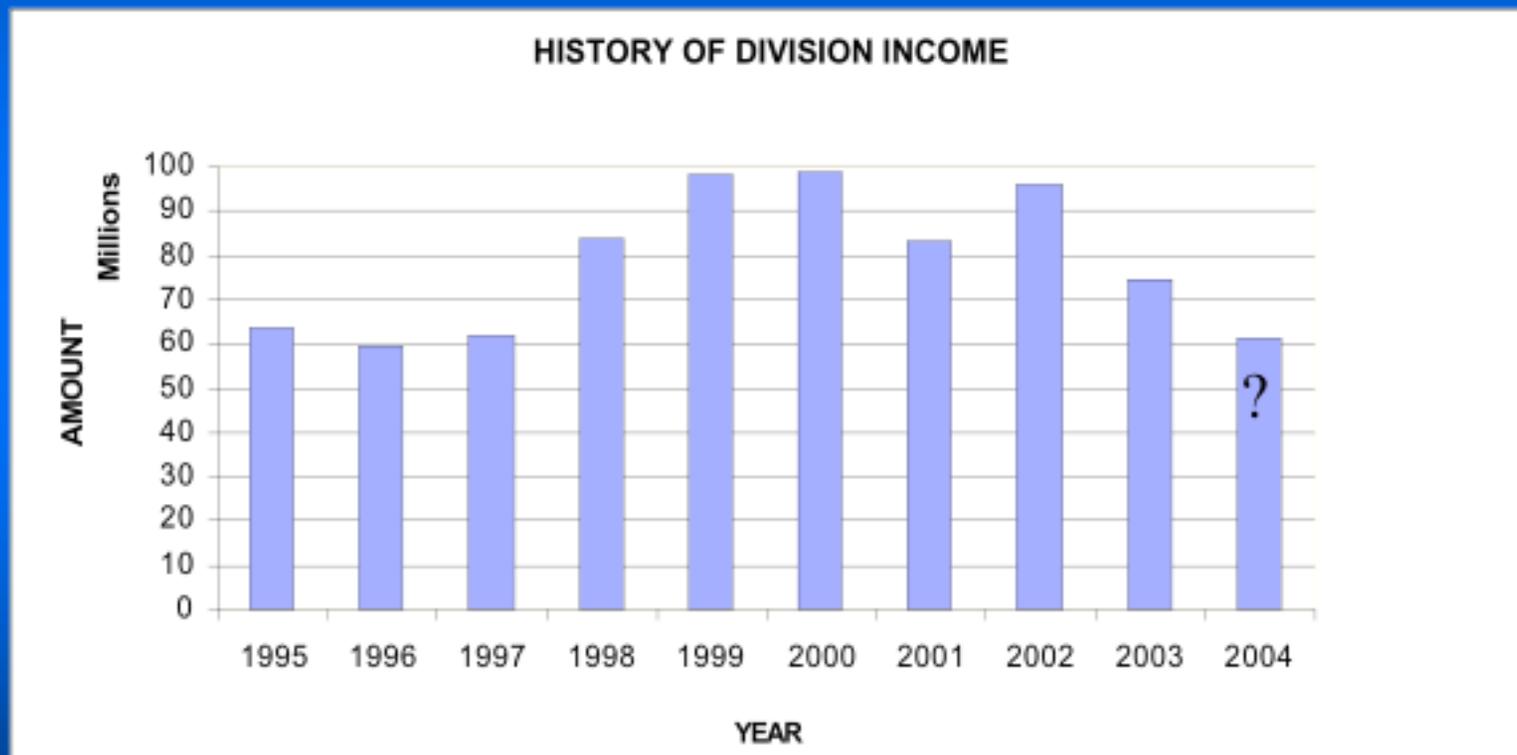
## LTP VITAL STATISTICS

- 75 civil servants, 67% PhD's, 22% MS's  
(~1/3 bio, ~1/3 geo, ~1/3 instr.)
- ~75 visiting scientists, university colleagues,  
& students
- ~220 on-site and near-site support contractors
- ~\$60\*M annual budget, including pass-through  
\*(ramping down from ~\$90M two years ago -- see bar chart)
- Refereed publications: approx. 80/yr

# MANPOWER



# DIVISION INCOME





## **A Summary of Accomplishments over the last 5 years - 1**

- Production of highly calibrated inter-satellite land cover data records from 1981 - present, incorporating MODIS, SeaWIFS, and VEGETATION with AVHRR.
- Confirmation of impacts of warming on vegetation and the carbon budget at higher northern latitudes using a combination of satellite data and improved modeling techniques.
- Project Scientist leadership of Landsat, Terra, NMP EO-1, ESSP and LDCM.
- Science and/or science management leadership of international field campaigns such as BOREAS, LBA, SAVE/SAFARI.
- Development and deployment of the AERONET network to monitor aerosols globally, as well as related data analyses, modeling and data distribution.



## **A Summary of Accomplishments over the last 5 years - 2**

- **Successful mapping of the topography of Mars by MOLA, and the measurements of cloud top height and dense dust layers above Mars**
- **Development of the GLAS instrument for ICESat, including**
  - **development of 3 space flight lasers & photon counting detectors**
  - **on orbit measurement resolutions of 4 cm and 2 arcsec achieved**
  - **global profiling of cloud and aerosol distributions**
- **Detection of a change in the flattening of the Earth's gravity field in 1998 that appears correlated with changes in the ocean**
- **Development of models of the Earth's magnetic field, and the dynamo that generates the main field**
- **Demonstration of imaging lidar for measuring canopy heights and sub-canopy topography**



## **A Summary of Accomplishments over the last 5 years - 3**

- New lidar measurement concept and approaches for future space missions: Earth science and planetary science - CO<sub>2</sub> Sounder, Biomass Lidar, Imaging Lidar, Laser transponders, trace gas sounders
- Determination of the orbits of Earth and planetary spacecraft to precisions that have enabled the seasonal elevation of the icecaps of Mars to be measured
- Developed and delivered the Mercury Laser Altimeter (MLA) instrument to the MESSENGER spacecraft; a small, high precision, low mass instrument suitable for other planetary missions.

The Lab has published an annual report for 2001 and 2002, and we are currently pulling together the report for 2003.

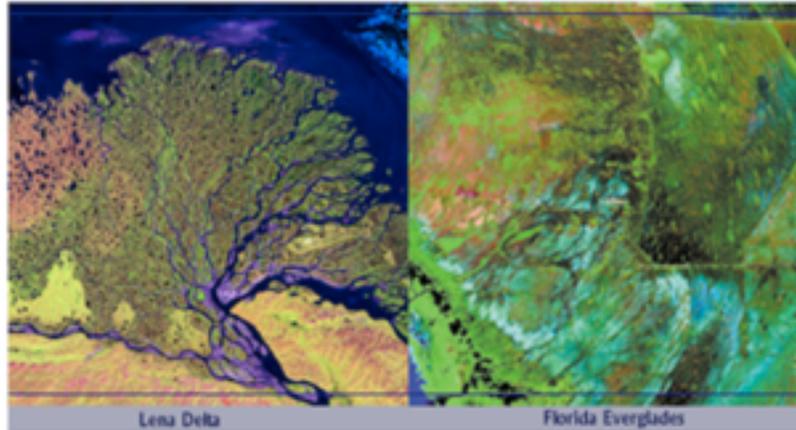
For more information about the activities in the Lab, please see our annual reports or visit our website at:

<http://ltpwww.gsfc.nasa.gov>

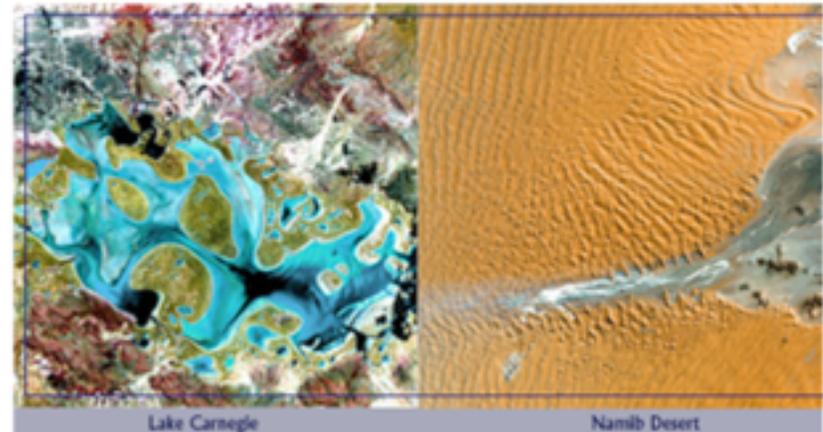


## THE LABORATORY FOR TERRESTRIAL PHYSICS

2002 Annual Report



*Celebrating 30 Years of Continuous Landsat Global Coverage!*



NASA Goddard Space Flight Center  
Greenbelt, MD 20771



# BACK-UP

## ISSUES & CHALLENGES

- How do we make effective use of full-cost accounting?
- How do we remain competitive at current head tax rates?
- How do we financially support the division and branches?
  - Currently we have to respond to numerous surveys, Directorate / Division audits and inspections; all of these activities consume time and require support staff
  - Next year we will probably be charged for space
- Required training, testing and surveys are taking a lot of people's time.