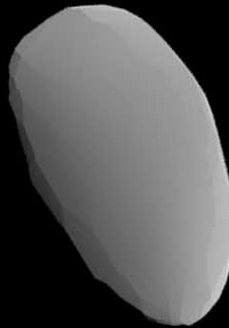


The re-entry of artificial meteoroid WT1190F



2008 TC3
Impact
October 7, 2008

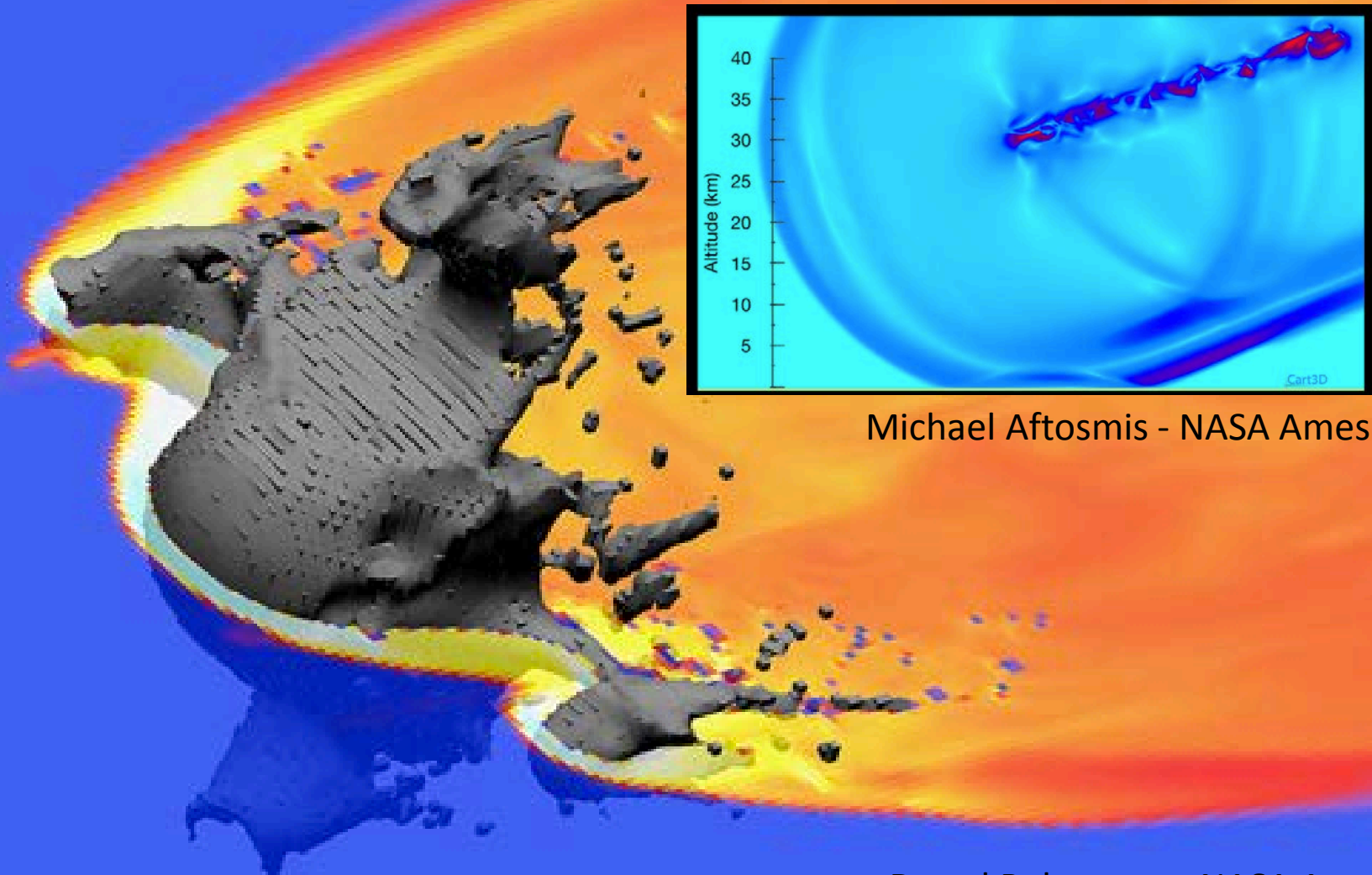
Mohammad Odeh
International Astronomical Center, Abu Dhabi
Peter Jenniskens
SETI Institute



20 m diameter
Ordinary chondrite asteroid
Vertical entry 20 km/s
Break-up at 29 km altitude

Asteroid Threat Assessment Project (ATAP) - NASA Ames

Jim Arnold, Craig Burkhardt et al.



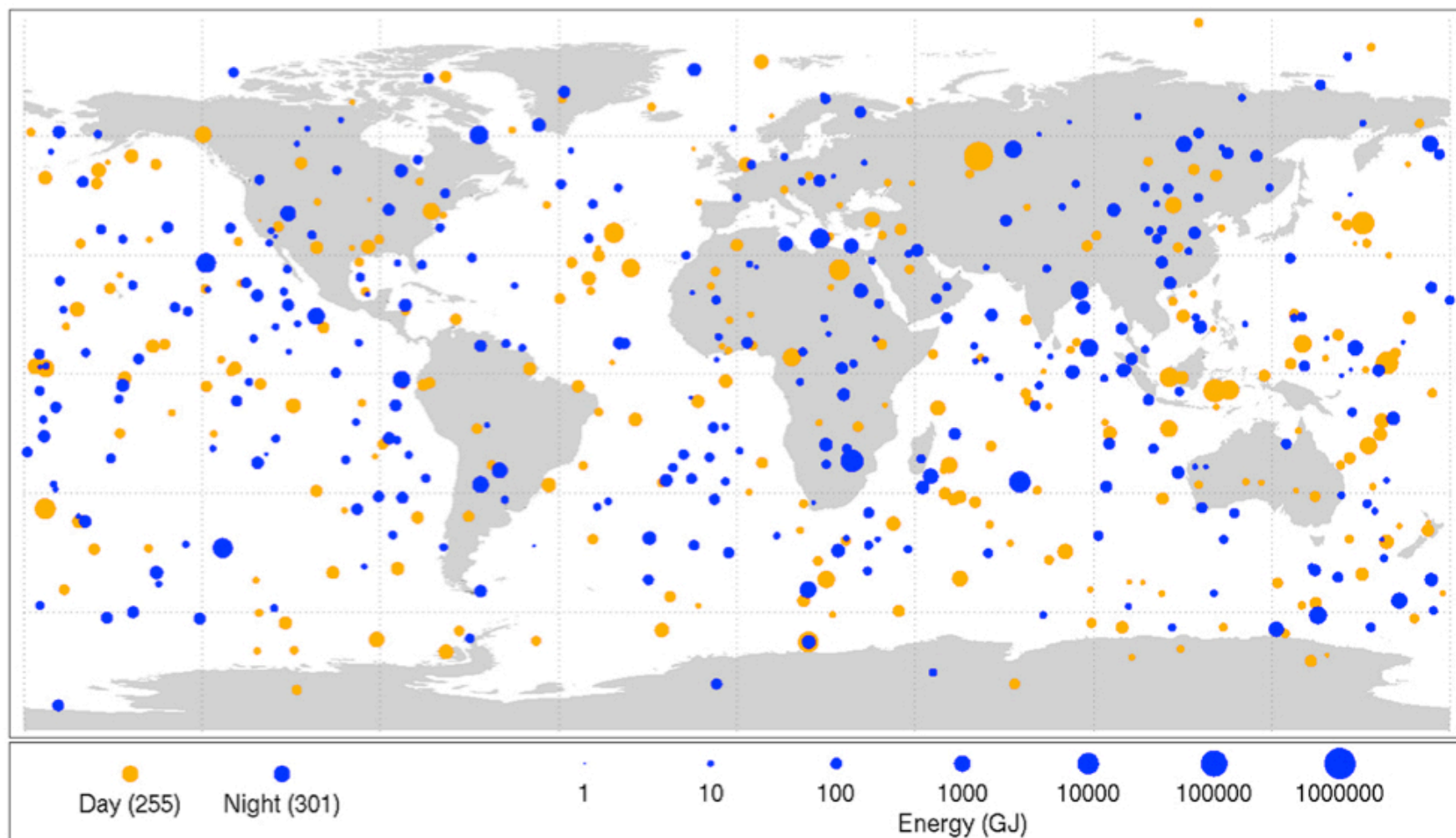
Michael Aftosmis - NASA Ames

Darrel Robertson - NASA Ames



Bolide Events 1994 – 2013

Small Asteroids that Disintegrated in Earth's Atmosphere



This diagram maps the data gathered from 1994-2013 on small asteroids impacting Earth's atmosphere and disintegrating to create very bright meteors, technically called "bolides" and commonly referred to as "fireballs". Sizes of orange dots (daytime impacts) and blue dots (nighttime impacts) are proportional to the optical radiated energy of impacts measured in billions of Joules (GJ) of energy, and show the location of impacts from objects about 1 meter (3 feet) to almost 20 meters (60 feet) in size.



Next TC3 Consortium

<http://impact.seti.org>



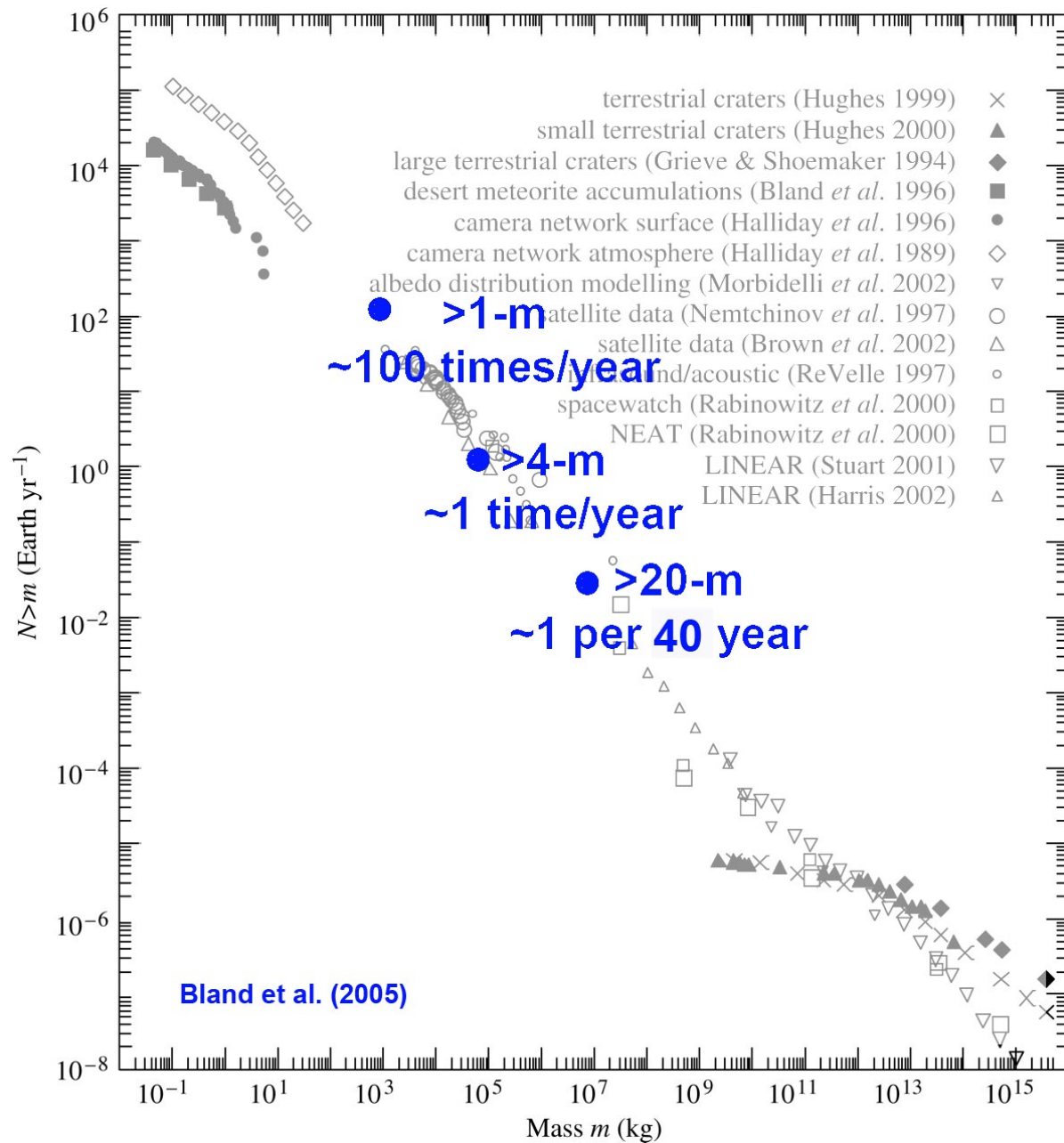
Mission Statement:

“Be prepared for the next 2008 TC3 impact”

Focus on two aspects:

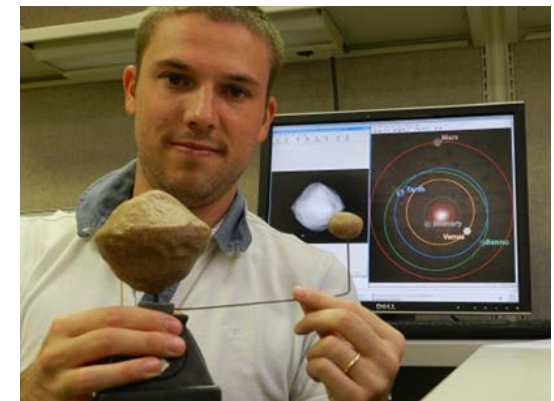
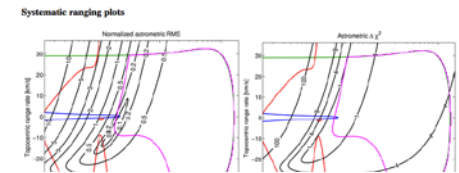
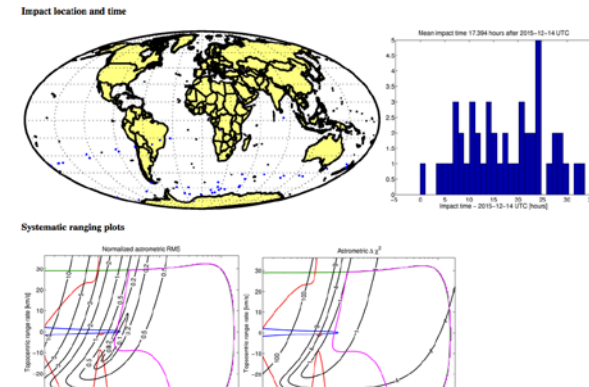
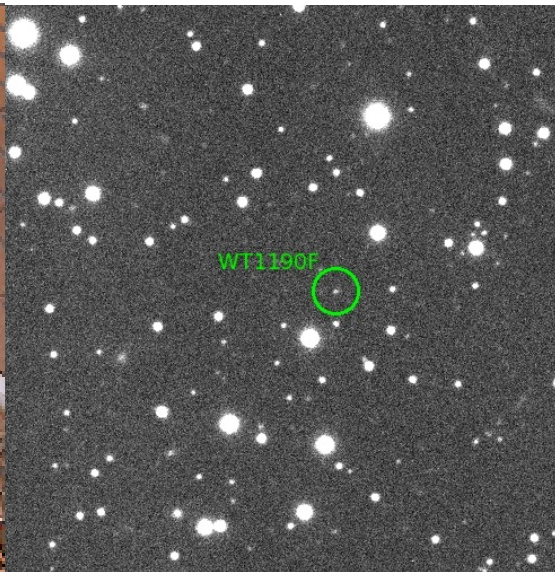
1. Airborne observations of the reentry
2. Rapid recovery of meteorites

Steve Larson	(Catalina Sky Survey)
John Tonry	(ATLAS)
José Luis Galache	(Minor Planet Center)
Steve Chesley	(NASA JPL)
Alan Fitzsimmons	(Queen's Univ. Belfast)
Eileen Ryan	(Magdalena Ridge Obs.)
Franck Marchis	(SETI Institute)
Ron Dantowitz	(Clay Center Observatory)
Jay Grinstead	(NASA Ames Res. Cent.)
Peter Jenniskens	(SETI Institute - POC)
You?	



NASA/JPL “Sentry” early alert

October 3, 2015: WT1190F



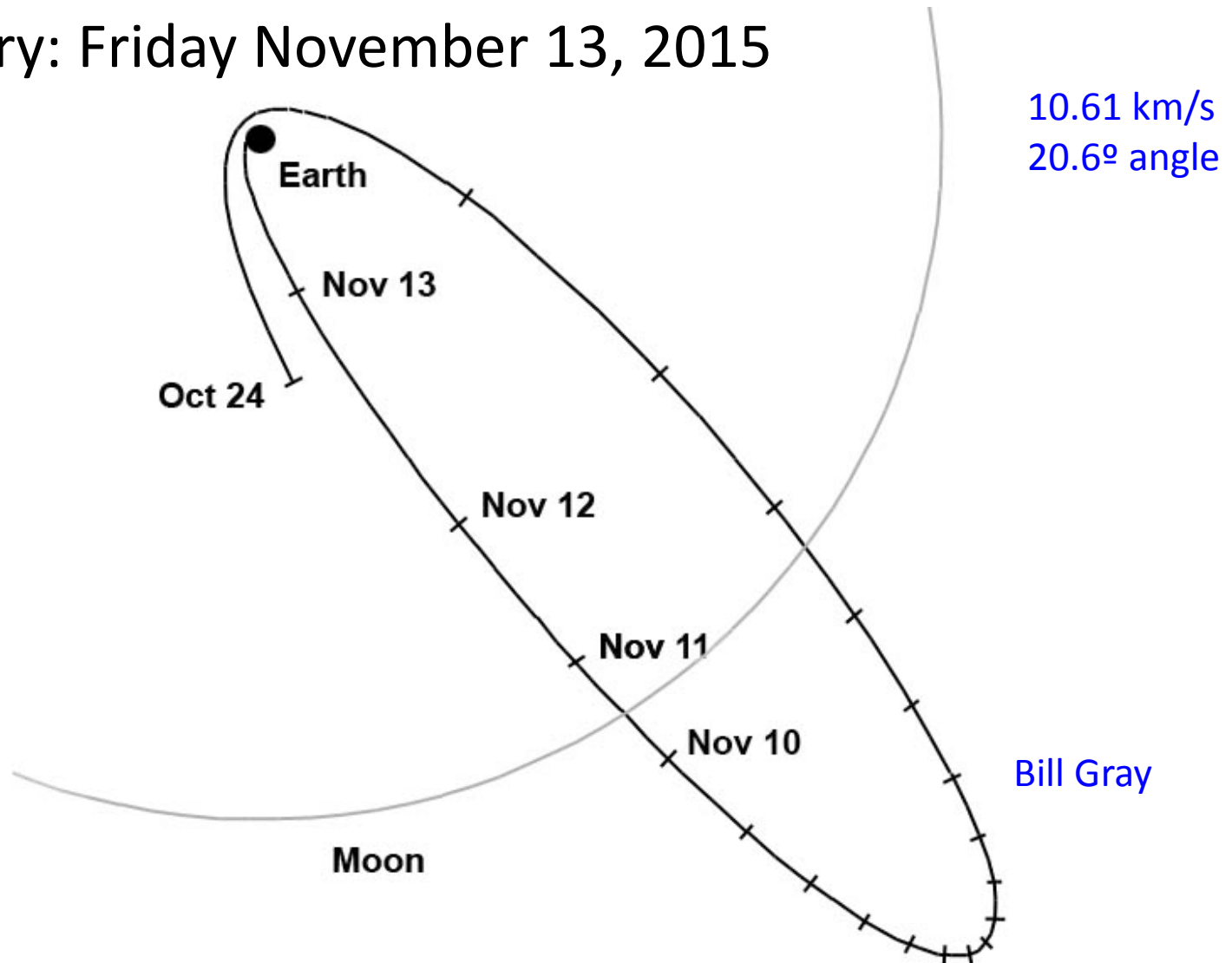
Davide Farnocchia (NASA/JPL)
Steve Chesley (NASA/JPL)
Marco Michelli (ESA NEOO CC)

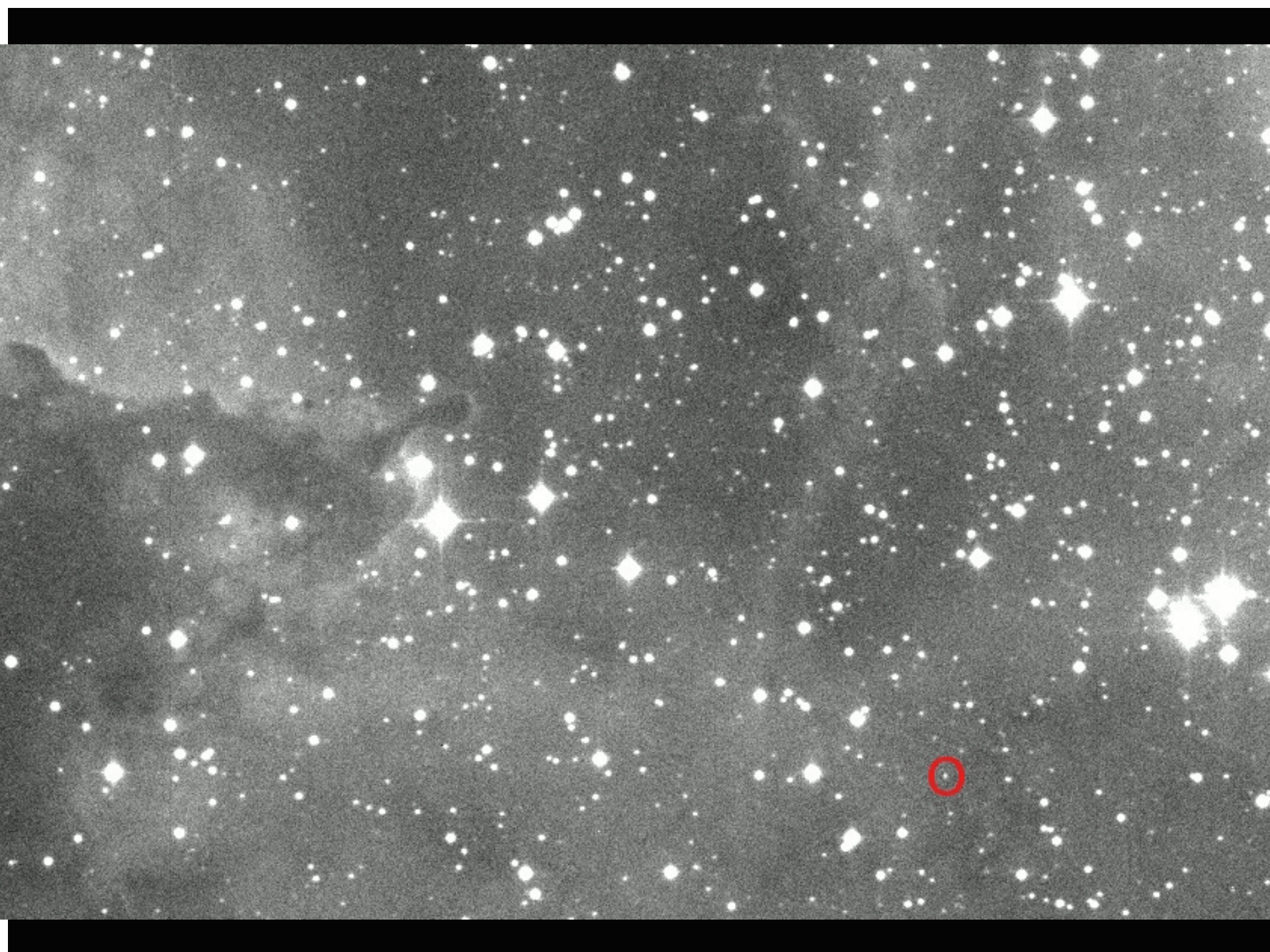
WT1190F

Found: October 3, 2015: one more passage Oct. 24

Traced back to: 2013, 2012, 2011, ..., 2009

Re-entry: Friday November 13, 2015







WT1190F

2015 11 13 05:34:28 - 05:34:47 UT

27 maxima in 20 second exposure

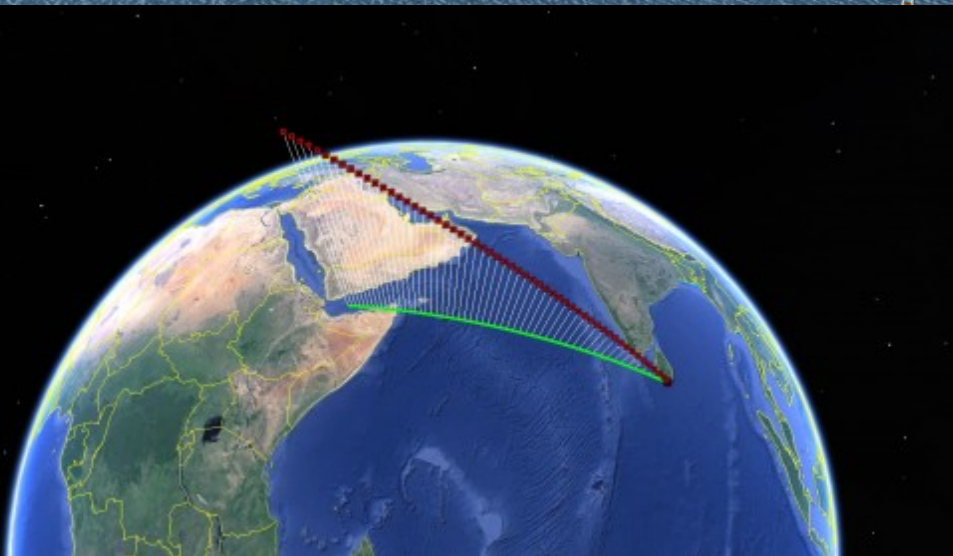
Speed 2564"/min, distance 16,400 km

Field 18.4'x18.4', N up

0.40-m Schmidt-Cassegrain + CCD

P. Birtwhistle Great Shefford Observatory

7)



P3 06:19

Google ea



Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat

IAC + UAE Space Agency chartered commercial G450



Mohammad Odeh
(IAC, Abu Dhabi)

Support:

وكالة الإمارات للفضاء
UAE SPACE AGENCY





UAE Space Agency

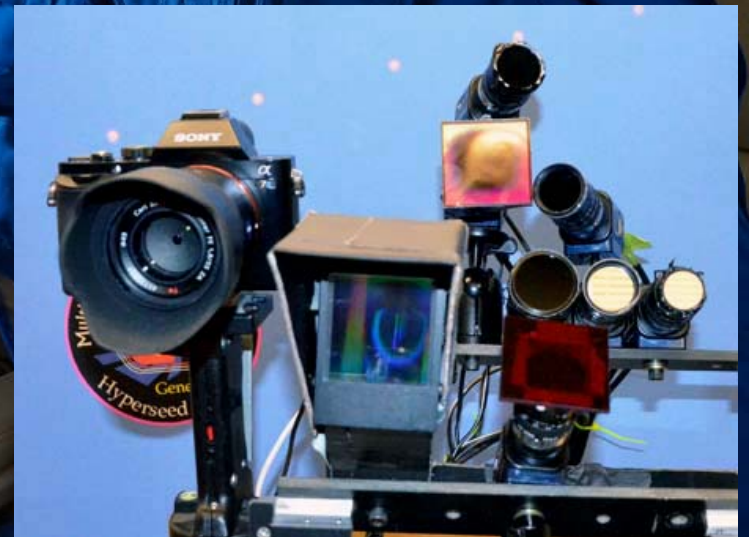
Dexter Southfield
/Embry-Riddle AU



ESA/University Stuttgart



SETI Institute





Map
Data

Map
View

Acft
Ctr

Up
Wx

North

Prev
P001B

Next
KAT

Map

N

HOT
DIRECT

TVH

BONOX

KATU

P002B

P001B

C200

FMS2
32.2nm
BIKOK

0.80

.88

.86

.84

.82

.80

.78

.76

.74

.72

214kt

AOA 0.35

DTRK
128

24

Set
0400z
Winds
0300z
FL450

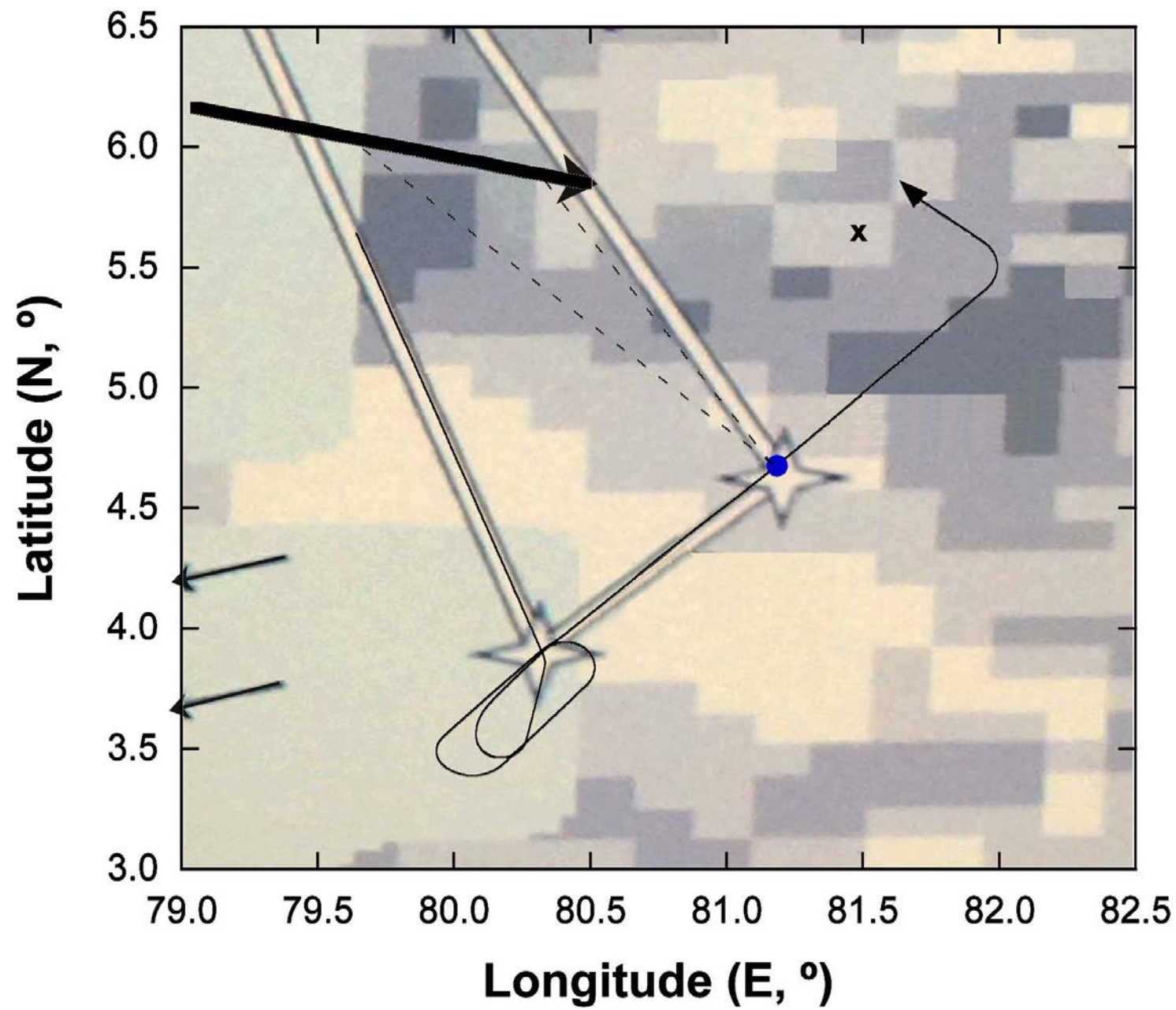
Sat (FL)
110-200
210-300
310-400
410+

Winds (kt)
40- 64
65- 89
90-114
115-139
140+

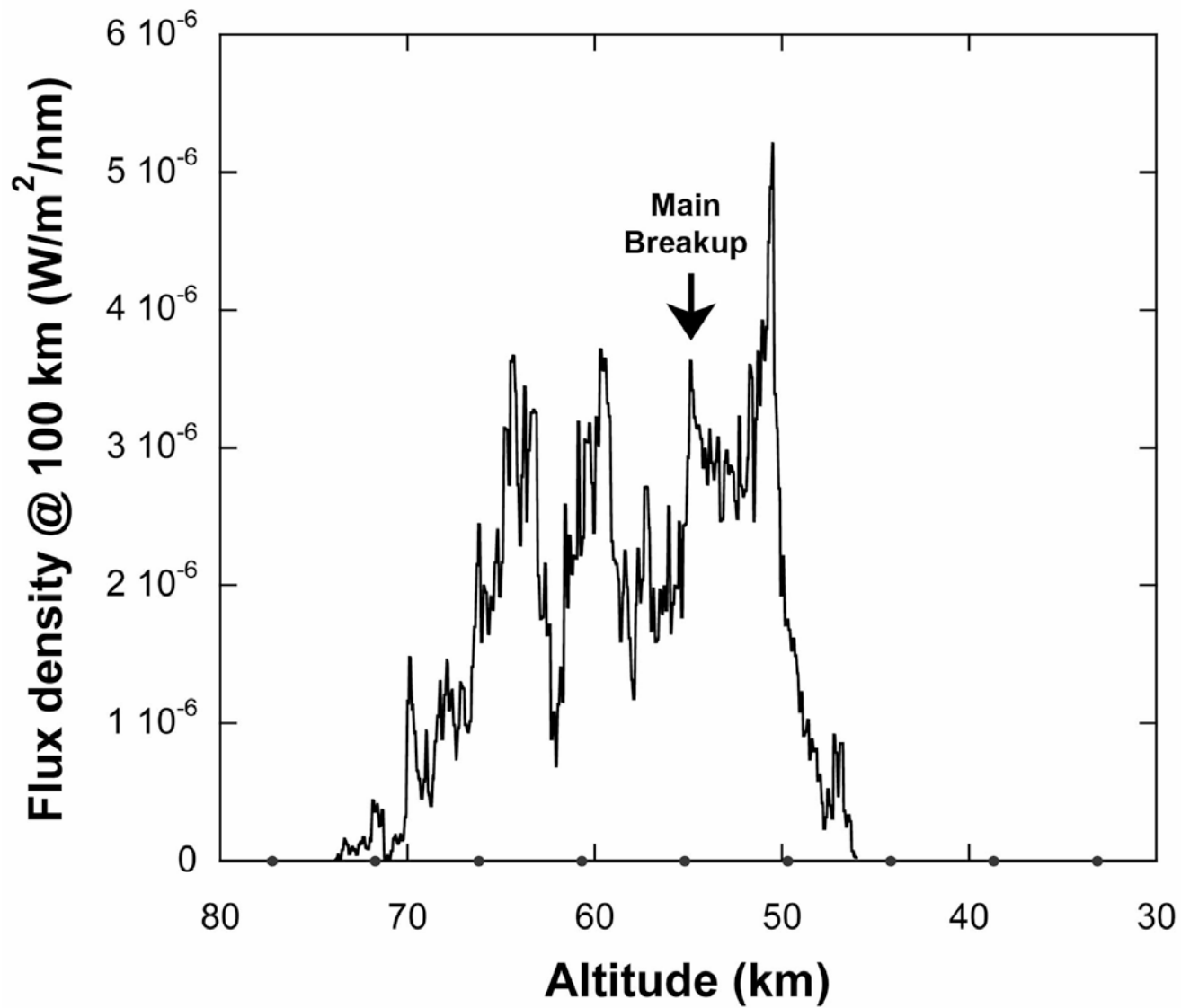
SAT -68
TAS 444
GS 426

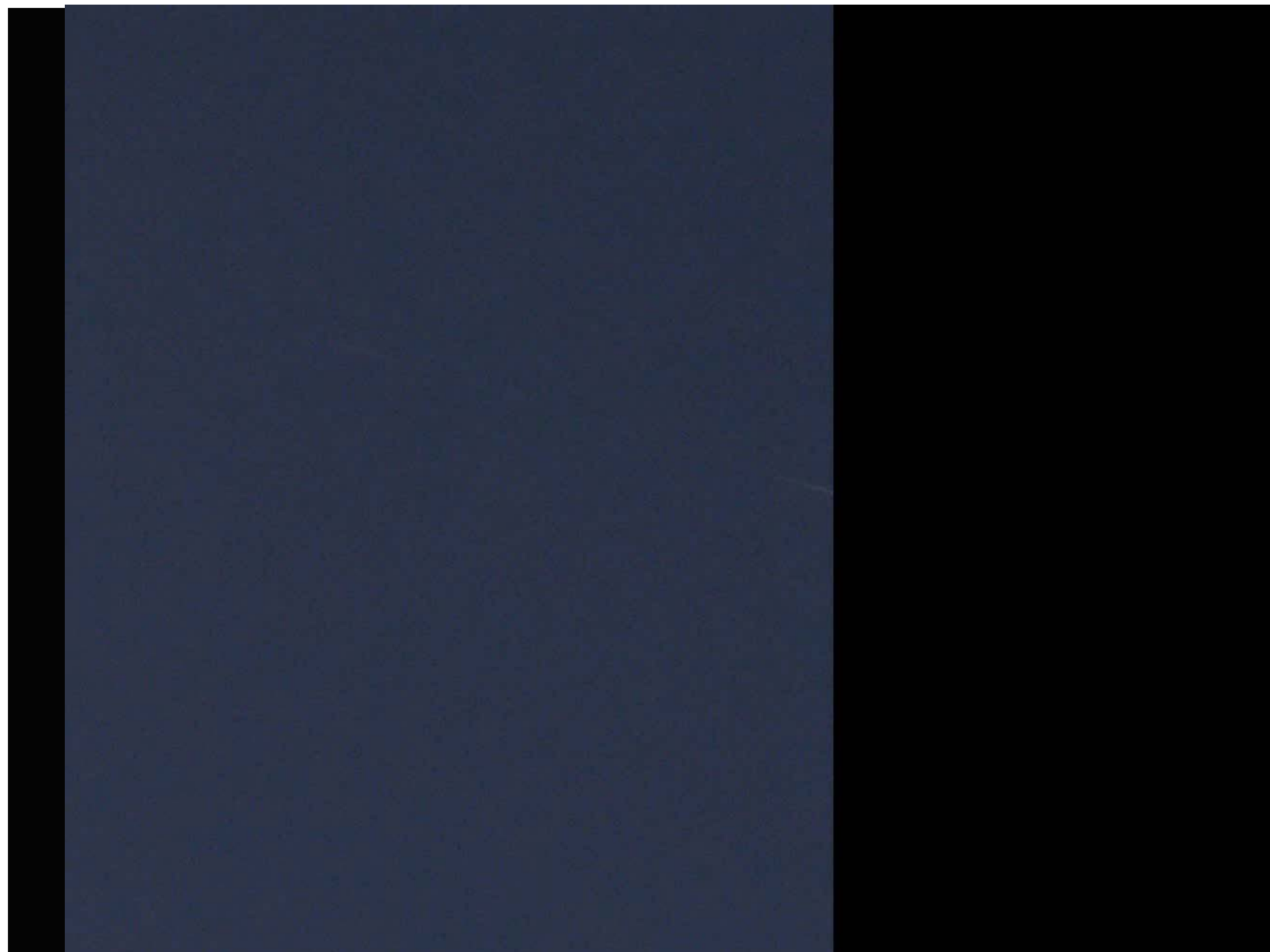
READ ONLY IN
STANDBY MODE
COMPASS CALIBRATED
WITH RADIOS ON





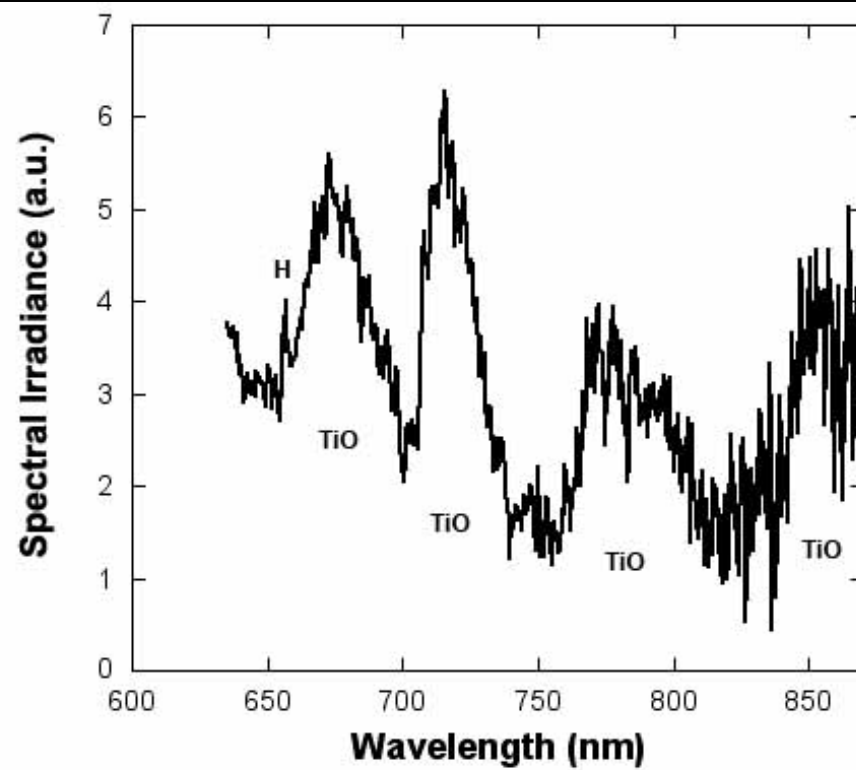




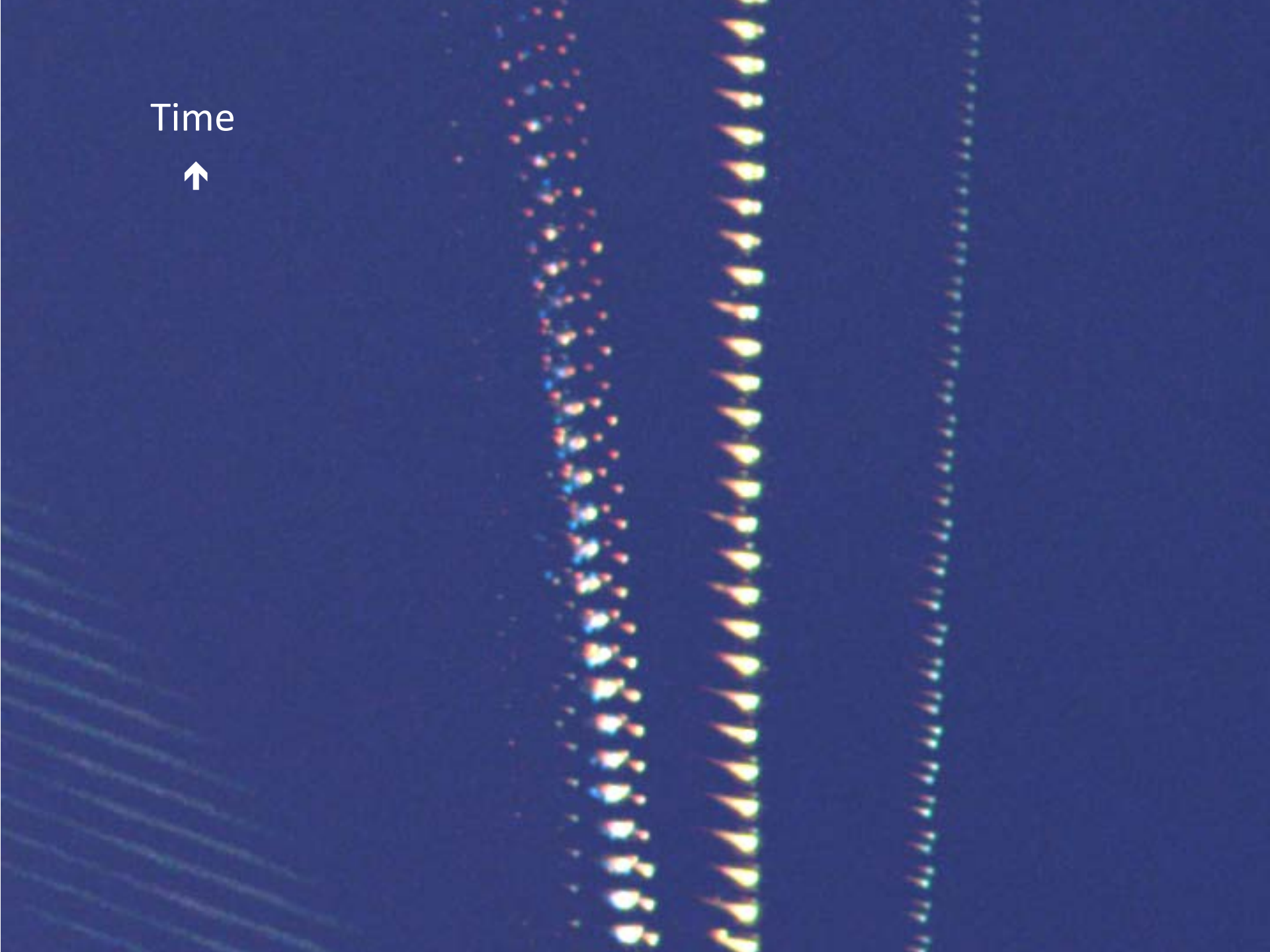


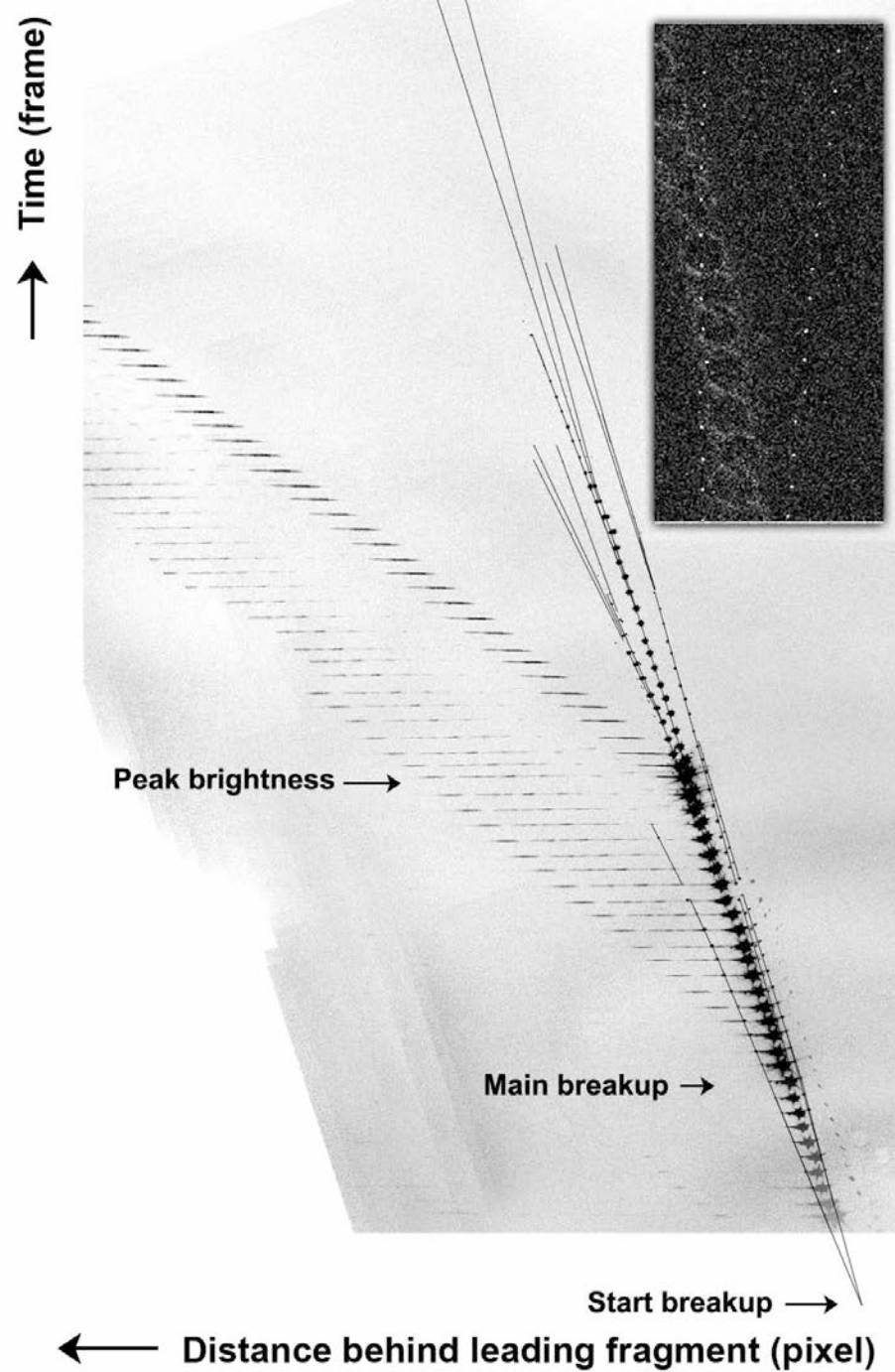


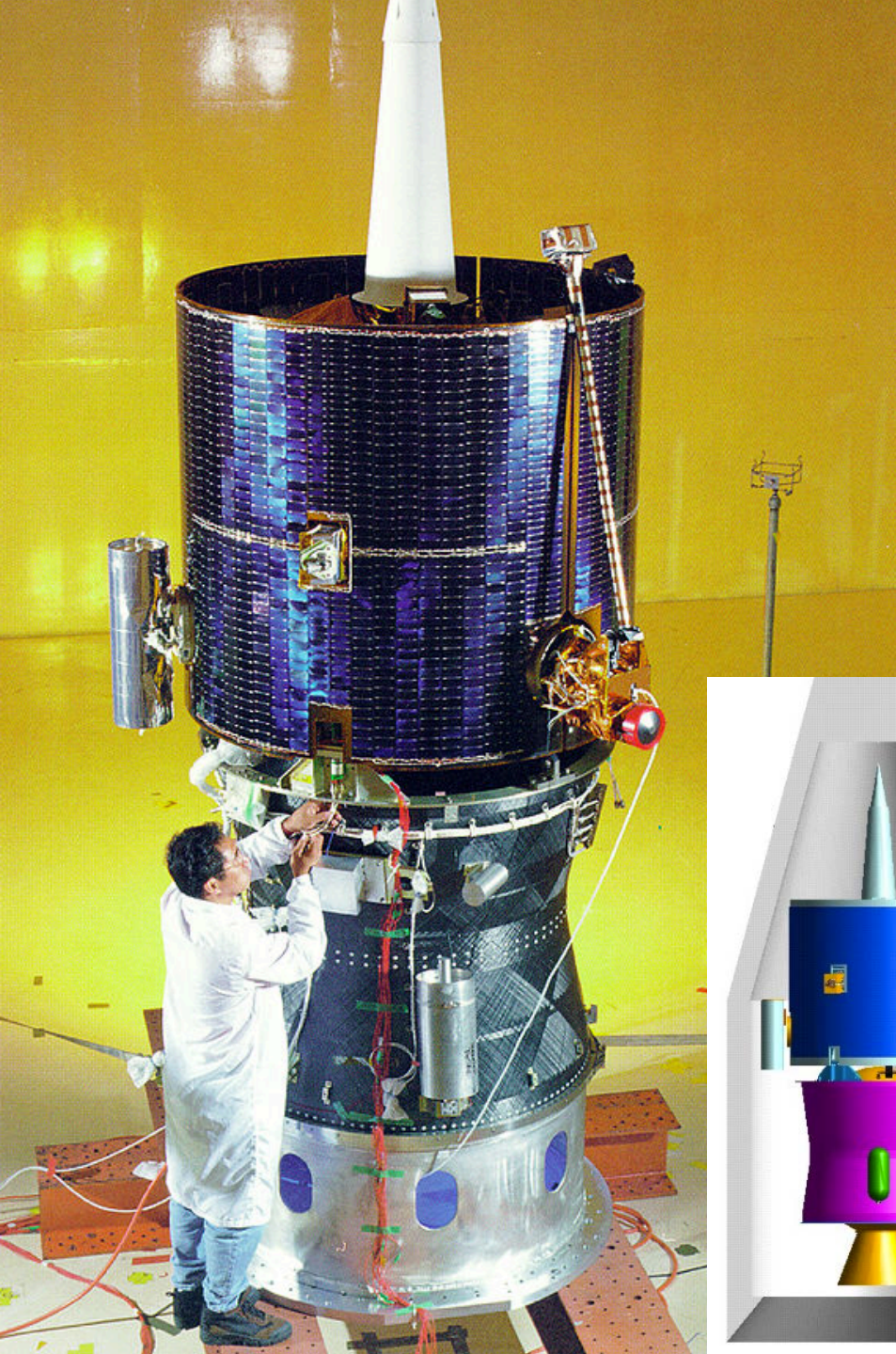
Dexter Southfield team



Time







Trans-Lunar Insertion Stage

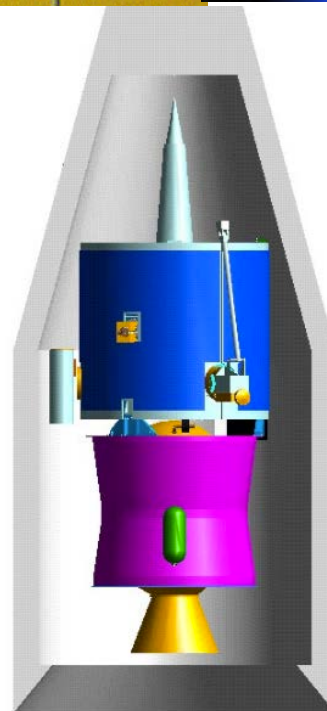


Leading candidate (1/13/2016):

LUNAR PROSPECTOR T.L.I.S.

Launch: January 7, 1998 UT

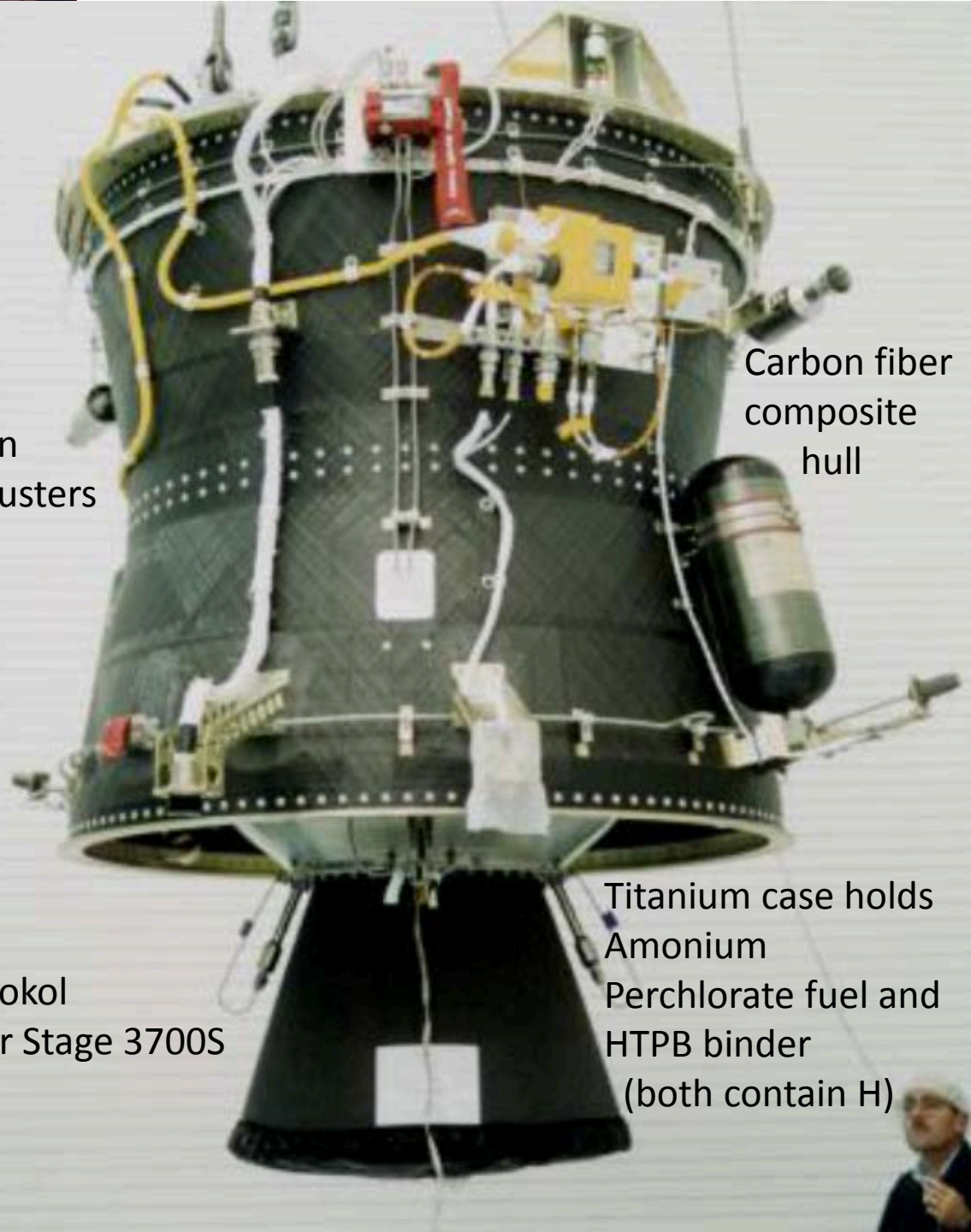
Lunar Prospector itself was deliberately crashed on Moon July 31, 1999





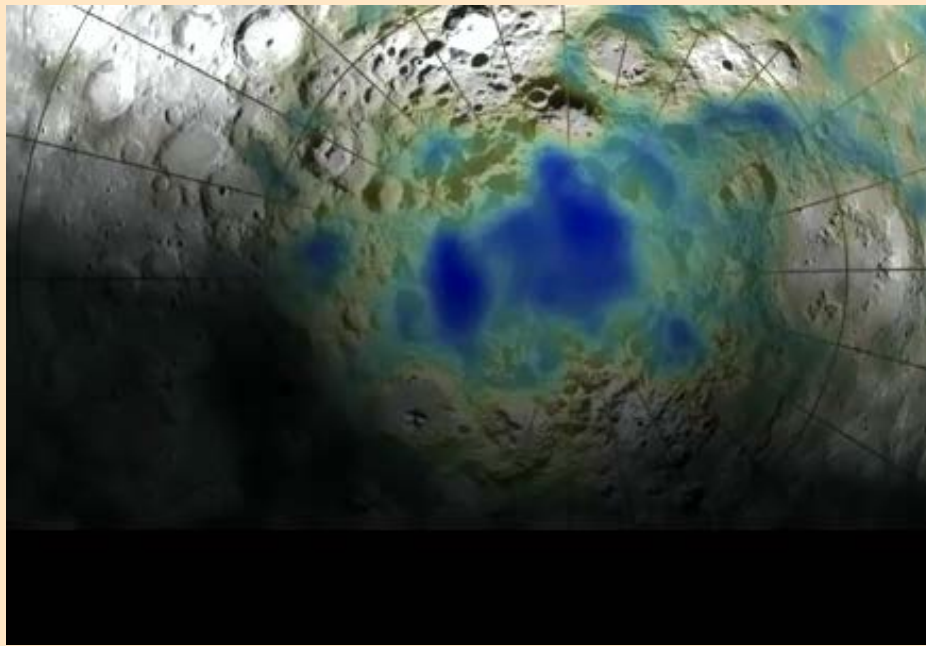
Spin
thrusters

Thiokol
Star Stage 3700S

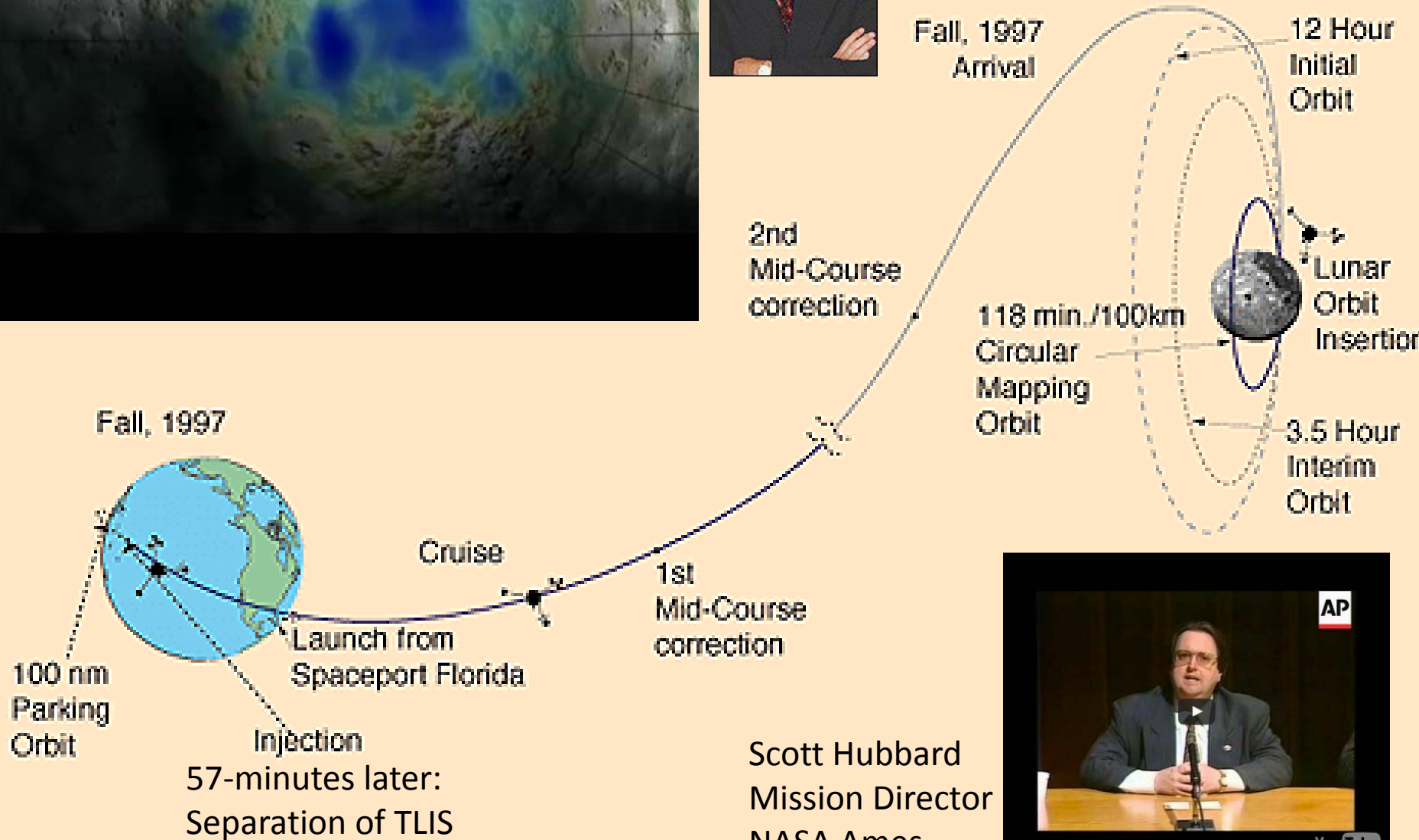


Carbon fiber
composite
hull

Titanium case holds
Ammonium
Perchlorate fuel and
HTPB binder
(both contain H)



P.I.: Alan Binder



Scott Hubbard
Mission Director
NASA Ames



Airborne Observations of an Asteroid Entry for High Fidelity Modeling: Space Debris Object WT1190F

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International Astronomical Center, Abu Dhabi, United Arab Emirates

Khalfan Al-Remeithi⁵, Khaled Al Hasmi⁶
UAE Space Agency, Abu Dhabi, United Arab Emirates

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