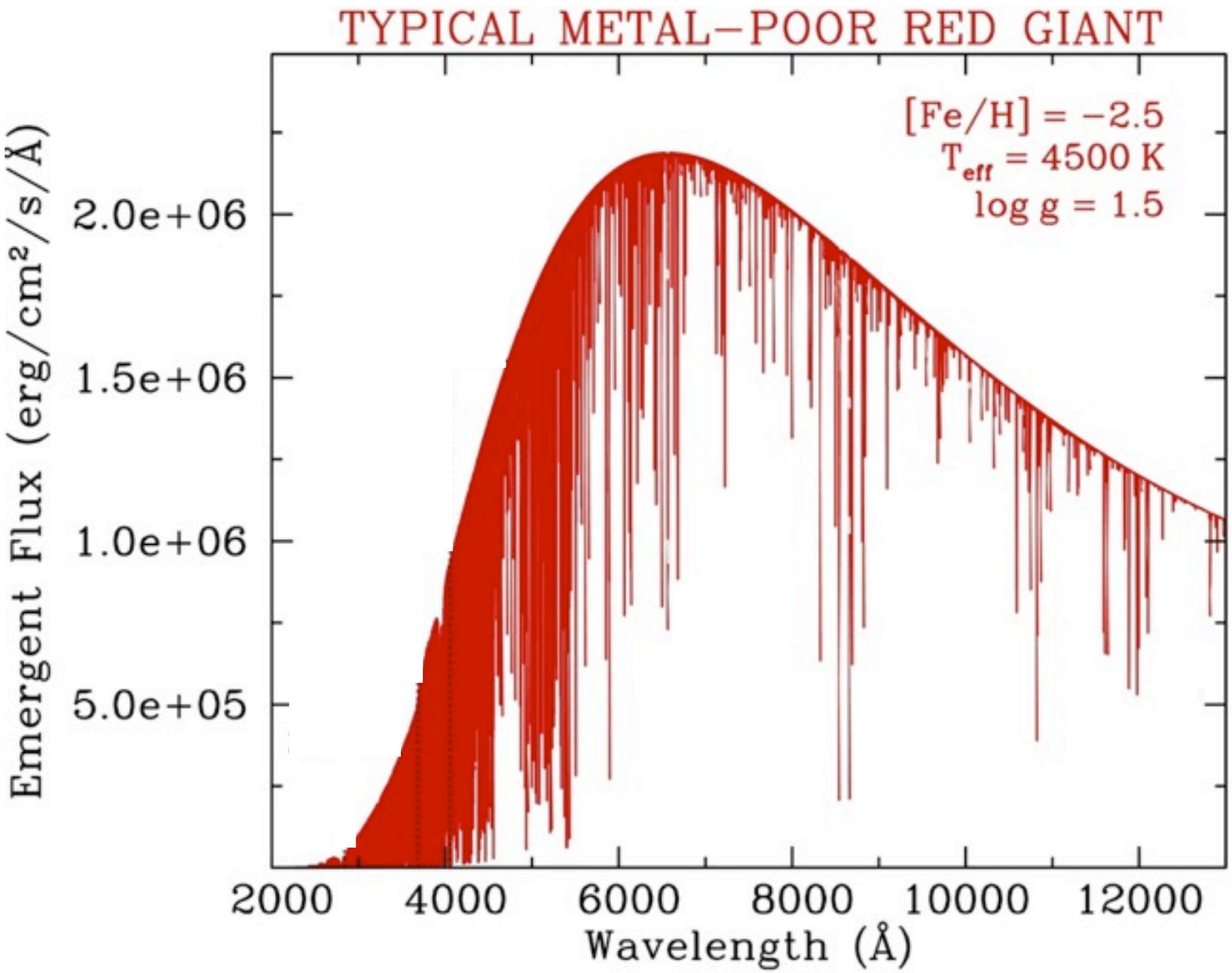
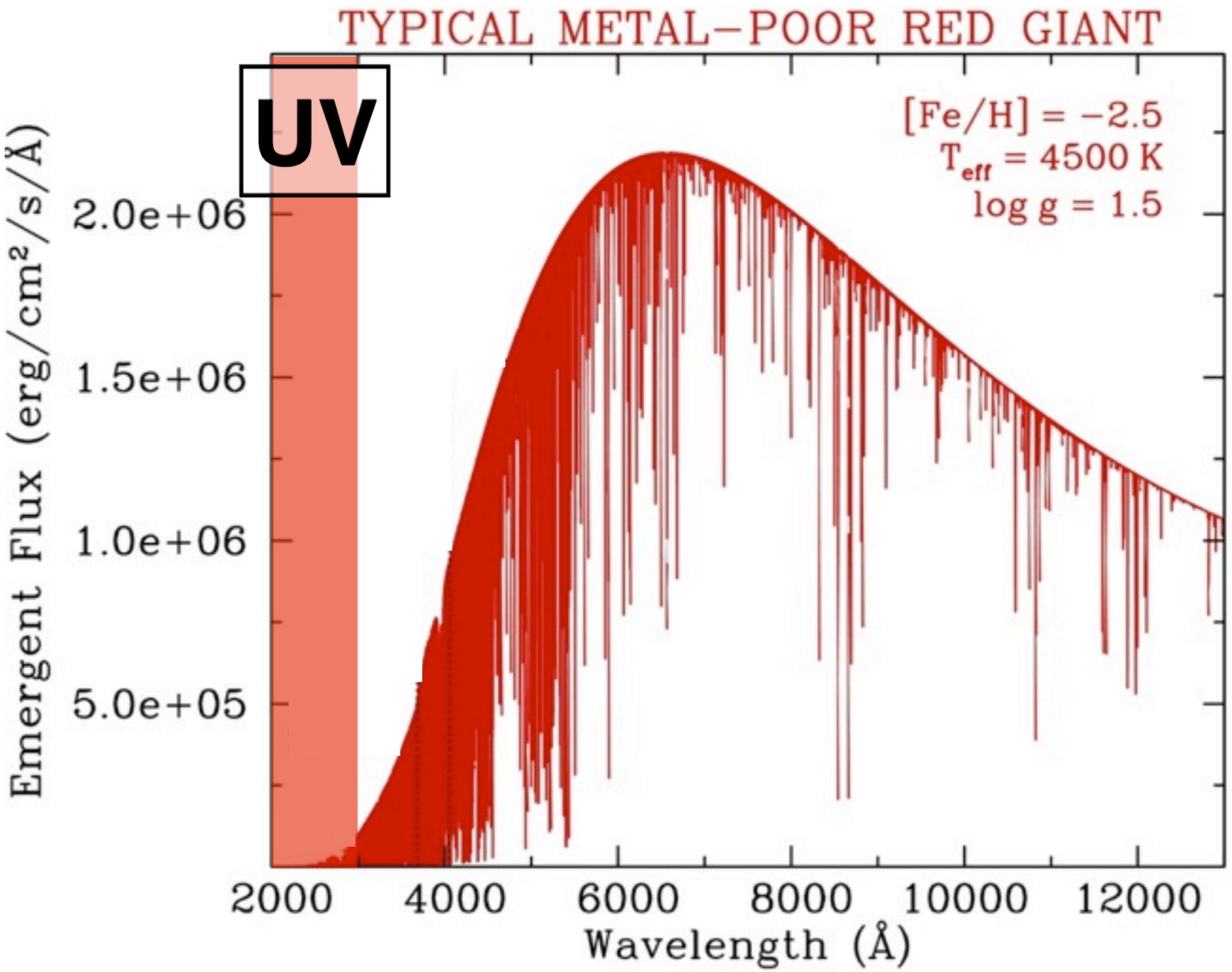
The impact of the Hubble Space Telescope and prospects for future space UV observatories

Ian U. Roederer, University of Michigan


TYPICAL METAL−POOR RED GIANT
[Fe/H] = −2.5
T_eff = 4500 K
log g = 1.5
Emergent Flux (erg/cm²/s/Å)
2.0e+06
1.5e+06
1.0e+06
5.0e+05
2000
4000
6000
8000
10000
12000
Wavelength (Å)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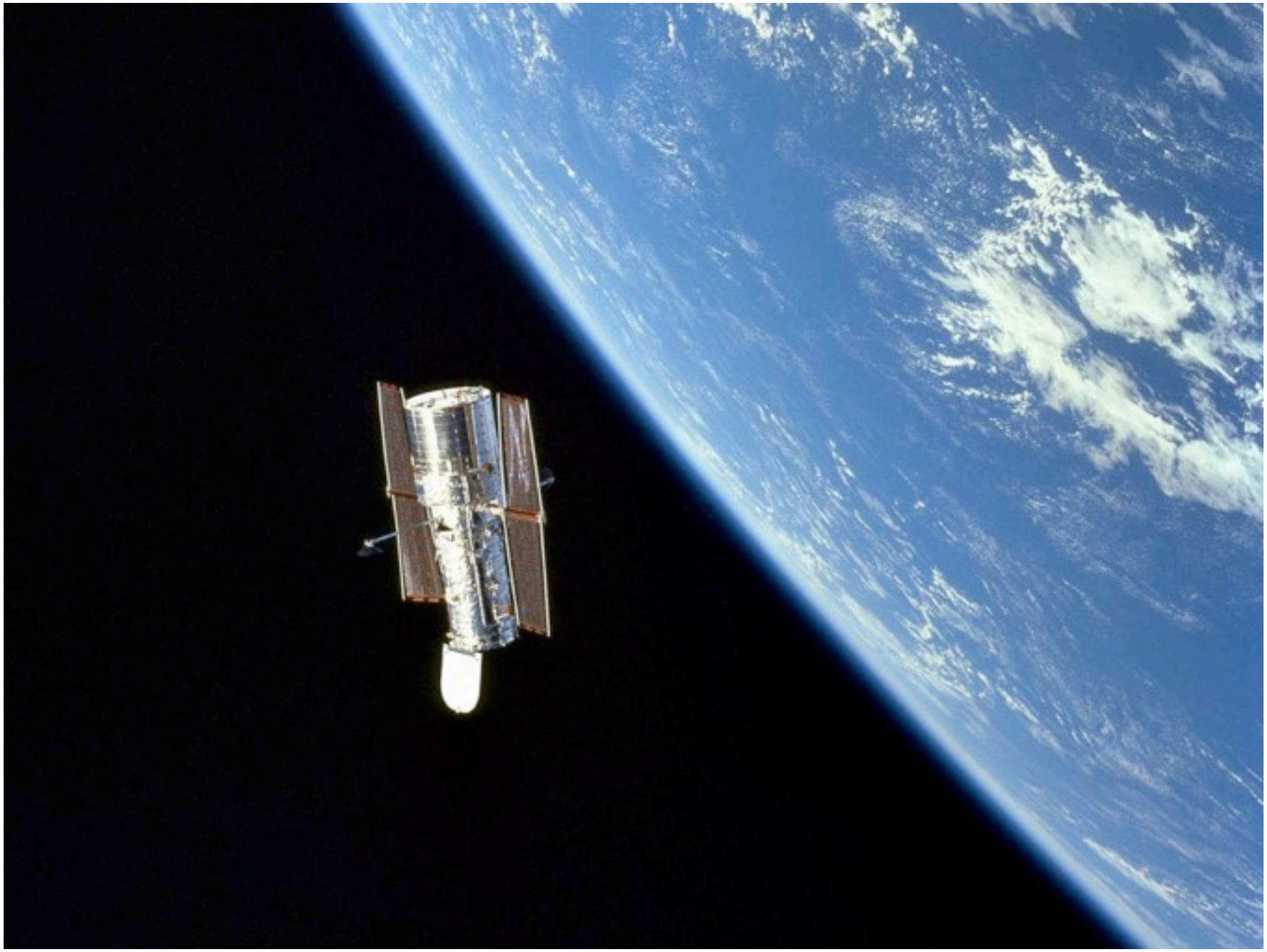

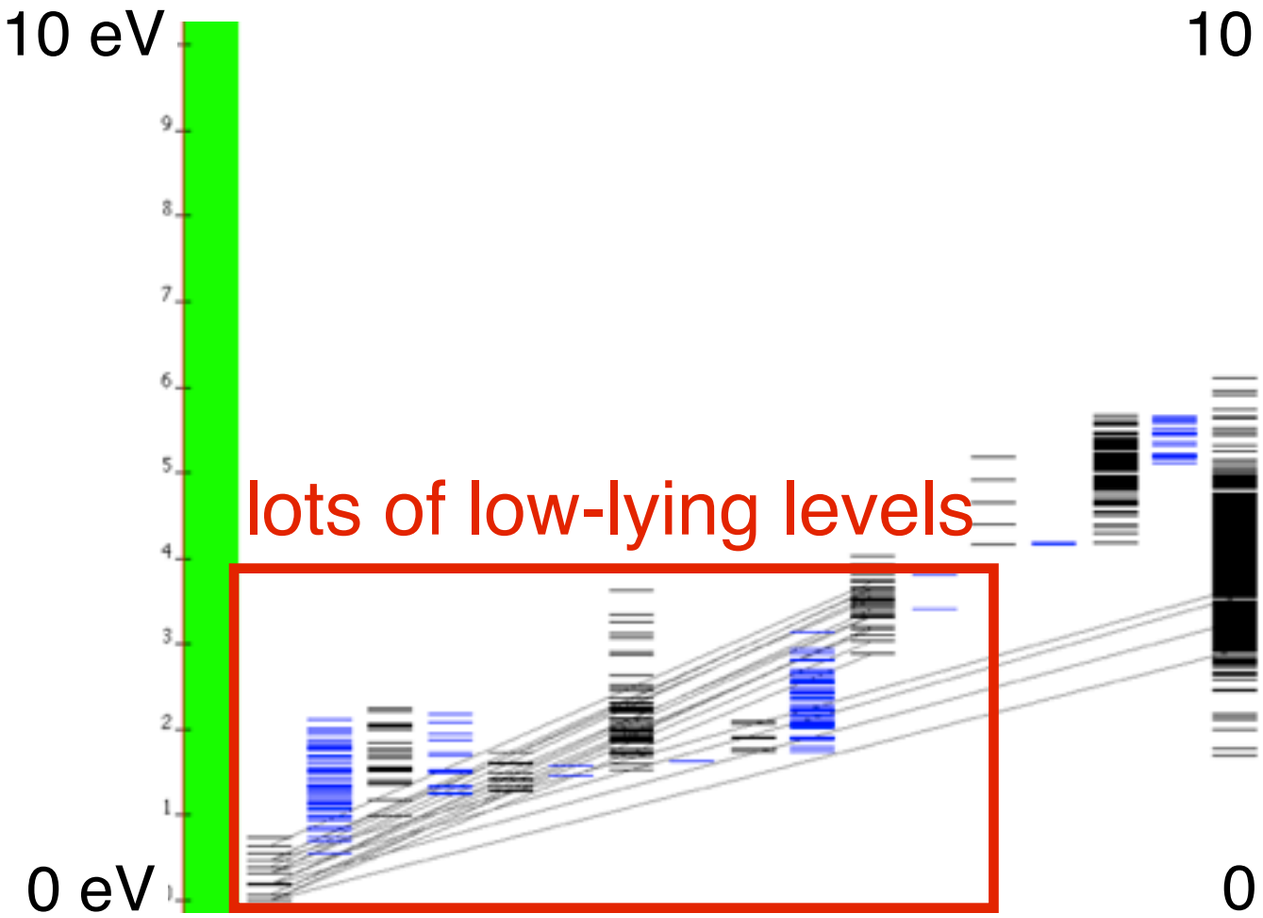

Nd II

Se I

Grotrian diagrams: NIST

	STIS	COS
Spectral resolution	~30,000+ (up to 115,000)	~20,000
Wavelength coverage per exposure	~850Å (continuous)	~100-120Å (3 non-contiguous bands)
Wavelengths accessible	1150-3100Å	~900-3200Å
Time to reach S/N ~ 30/1 at 2500Å in $Z \sim Z_\odot$ G5III star with V ~ 10	1.4×10^6 sec (389 hours)	1.4×10^5 sec (39 hours)

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(roughly equivalent to the total amount of time allocated annually to all "stars" projects)

usually,
1 ≲ **N** ≲ **5** stars
with **V** ≲ **10**

A SEARCH FOR STARS OF VERY LOW METAL ABUNDANCE. II

TIMOTHY C. BEERS[1,2]

Department of Physics and Astronomy, Michigan State University, East Lansing, Michigan 48824

GEORGE W. PRESTON[2] AND STEPHEN A. SHECTMAN[2]

The Observatories, Carnegie Institution of Washington, Pasadena, California 91101

Received 27 November 1991; revised 19 February 1992

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The stellar content of the Hamburg/ESO survey ⋆,⋆⋆

IV. Selection of candidate metal-poor stars

N. Christlieb[1,2], T. Schörck[2], A. Frebel[3], T. C. Beers[4], L. Wisotzki[5], and D. Reimers[2]

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Mapping the Universe

SEGUE

SEGUE-2

RAVE

RADIAL VELOCITY EXPERIMENT

APOGEE

SDSSIII

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SkyMapper

Sloan Digital Sky Survey

Mapping the Universe

SEGUE

SEGUE-2

RAVE

RADIAL VELOCITY EXPERIMENT

APOGEE

SDSSIII

VERY LOW METAL ABUNDANCE S

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na, California 91101

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Sloan Digital Sky Survey

Mapping the Universe

SEGUE

SEGUE-2

RAVE

RADIAL VELOCITY EXPERIMENT

APOGEE 2

SDSSIII

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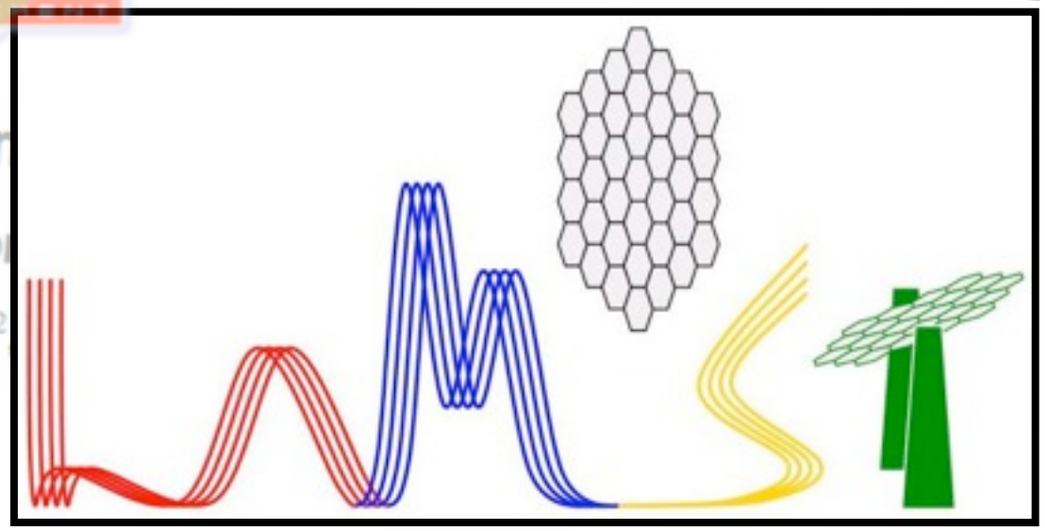
RADIAL VELOCITY EXPERIMENT

APOGEE

2

SDSSIII



Safari File Edit View History Bookmarks Window Help

Fri 10:57 PM

HST Search

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A Prairie Home Companion for Fe... | HST Search

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Archive Status

HST Search Form

(Help)
Field Descriptions

Standard Form

File Upload Form

Search | Reset | Clear Form

Target Name

Resolver: NED

Radius (arcmin): 3.0

Right Ascension

Declination

Equinox: J2000

Imagers	Spectrographs	Other
ALL NONE	ALL NONE	ALL NONE
STIS	STIS	FGS
NICMOS	NICMOS	HSP
WFPC2	GHRS	
WF/PC	FOS	
FOC	FOC	
ACS	ACS	
WFC3	WFC3	
COS	COS	

Start Time | Exp Time | Proposal ID | Release Date

Dataset | Filters/Gratings | Obset ID | Archive Date

Target Descrip | Apertures | Observations: Science Calibration

PI Last Name

User-specified field 1 | Field Descriptions

User-specified field 2 | Field Descriptions


Image:
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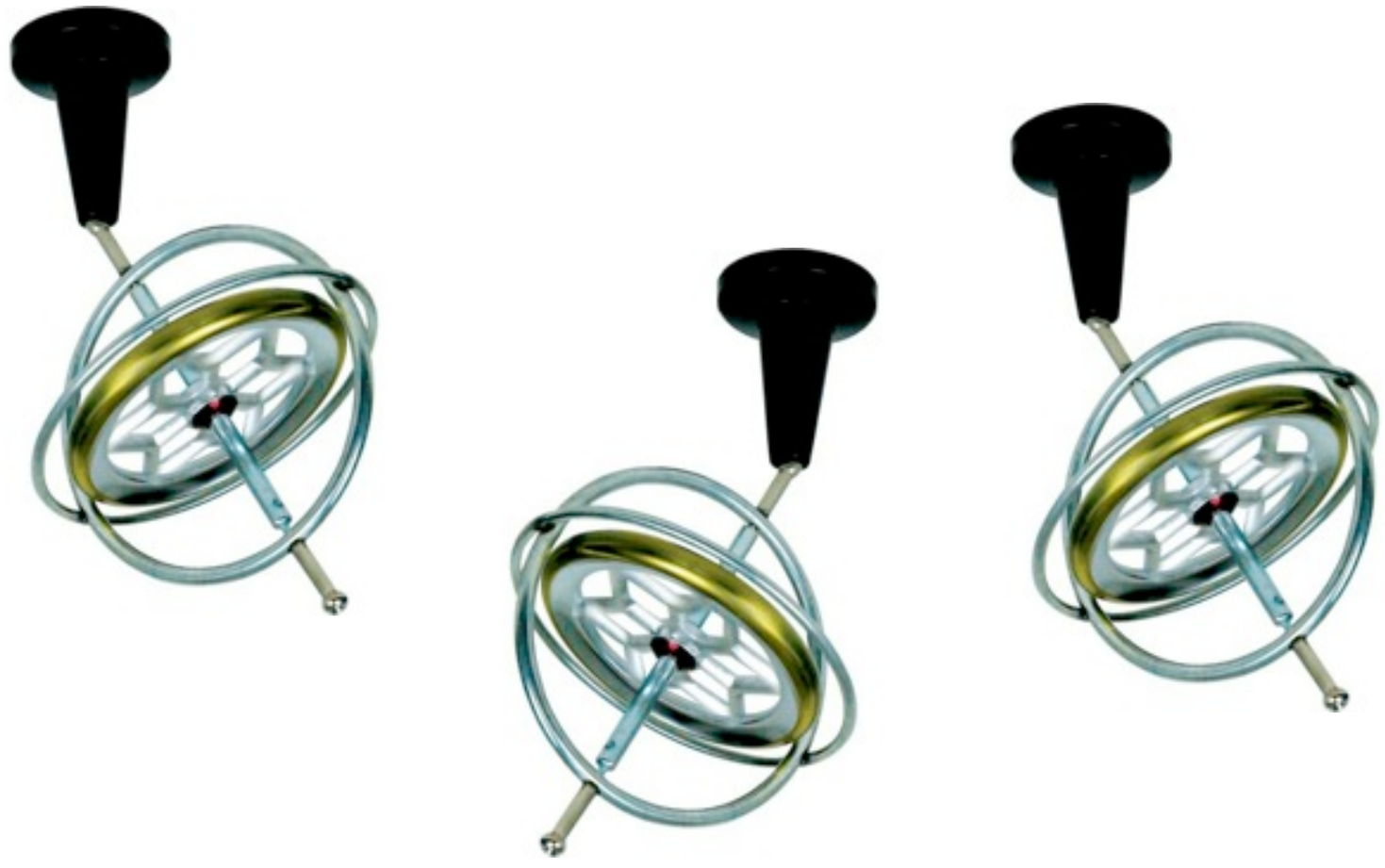
and DEEPER



Jorge Cham (c) 2007

J ames
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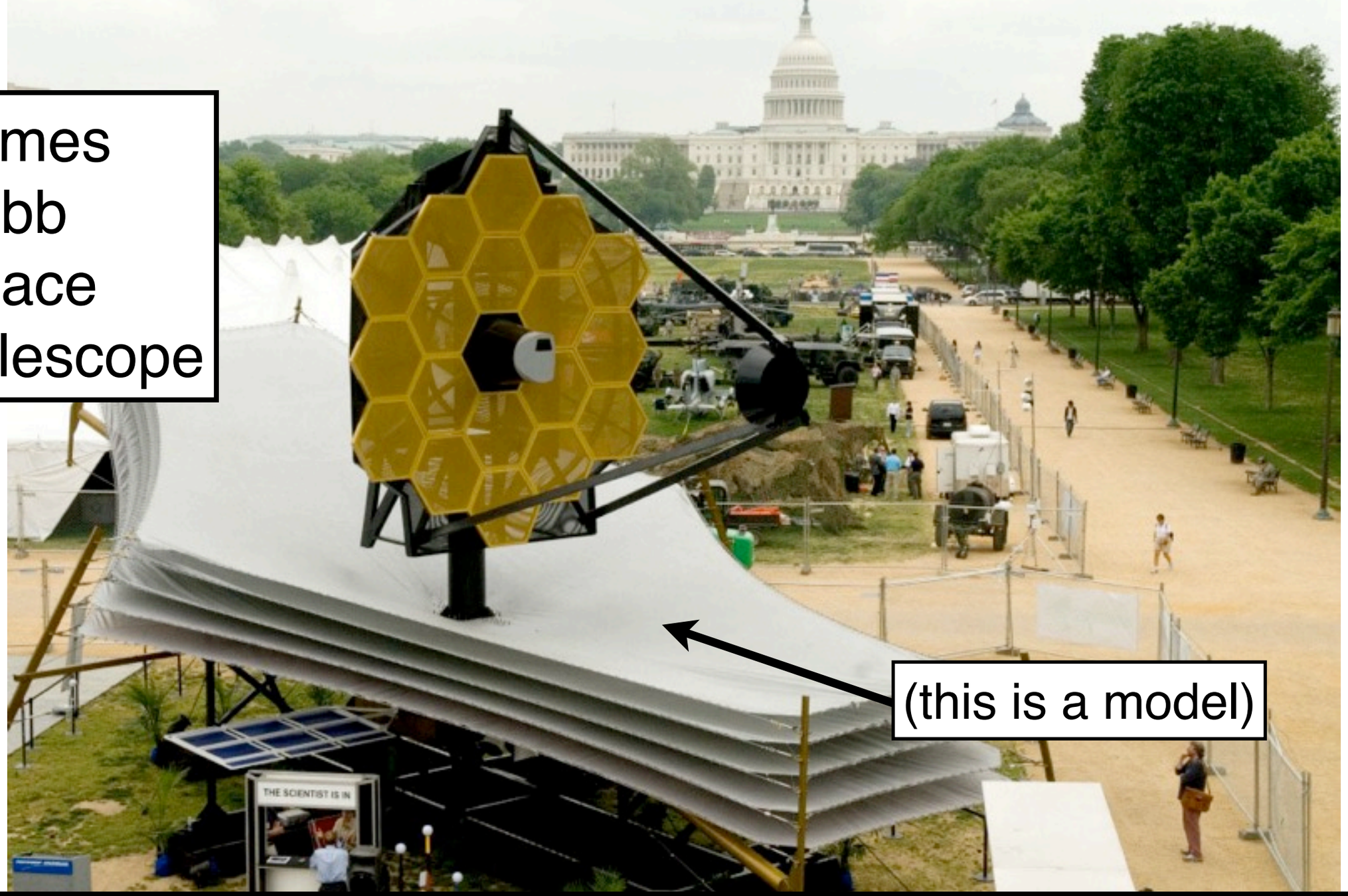
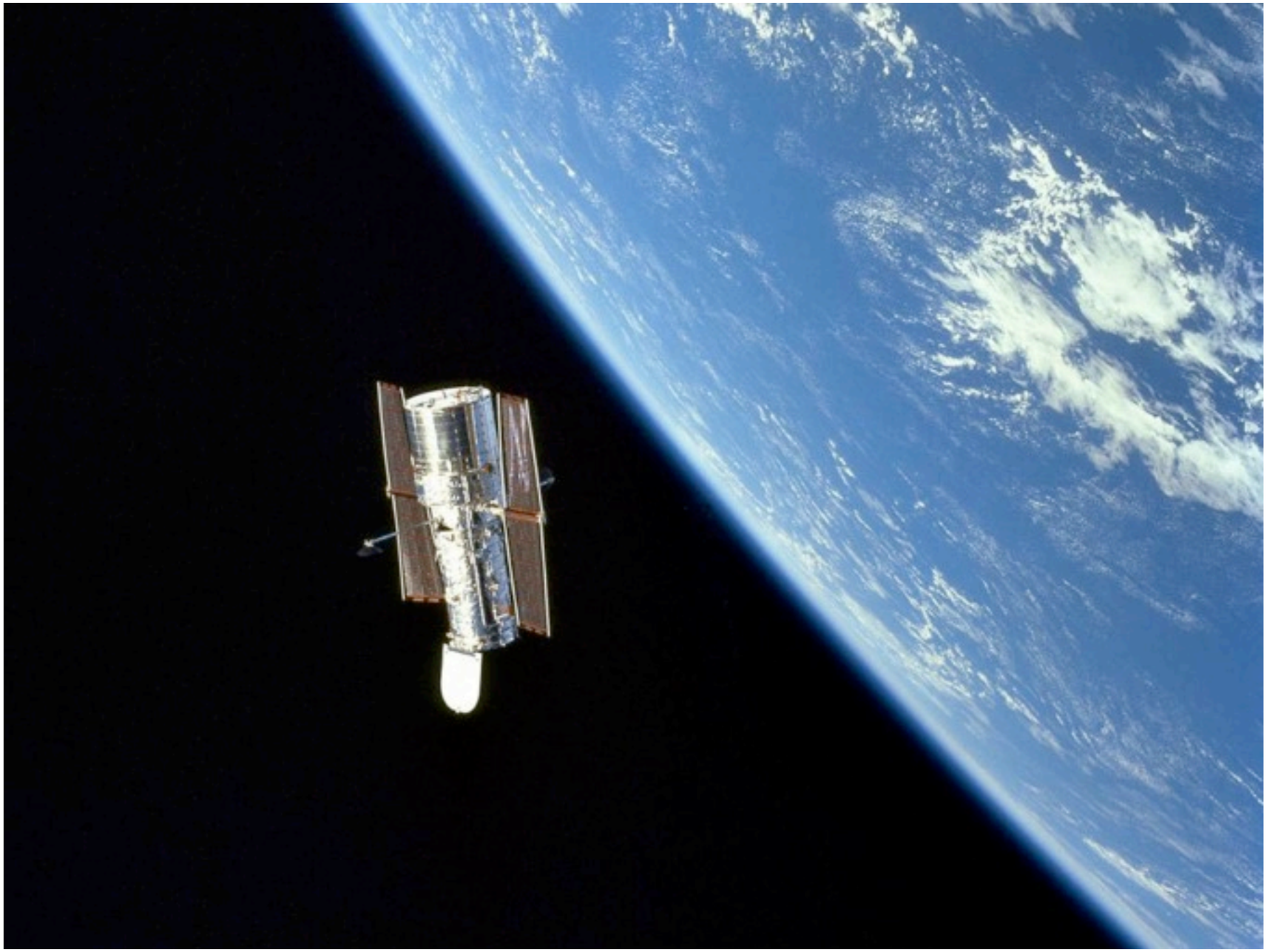


(this is a model)

image: NASA



THE SITE IS UNDER CONSTRUCTION NOW.

MORE NEW MATERIALS AS WELL AS RUSSIAN VERSION WILL APPEAR SOON!

The aim of the World Space Observatory-Ultraviolet - WSO-UV mission is to study the Universe in the 115 - 310 nm ultraviolet (UV) wavelengths range, which is beyond the reach of ground-based instruments. WSO-UV is a major international collaboration with Russia playing the leading role. The project has been included into the Federal Space Program of Russia.

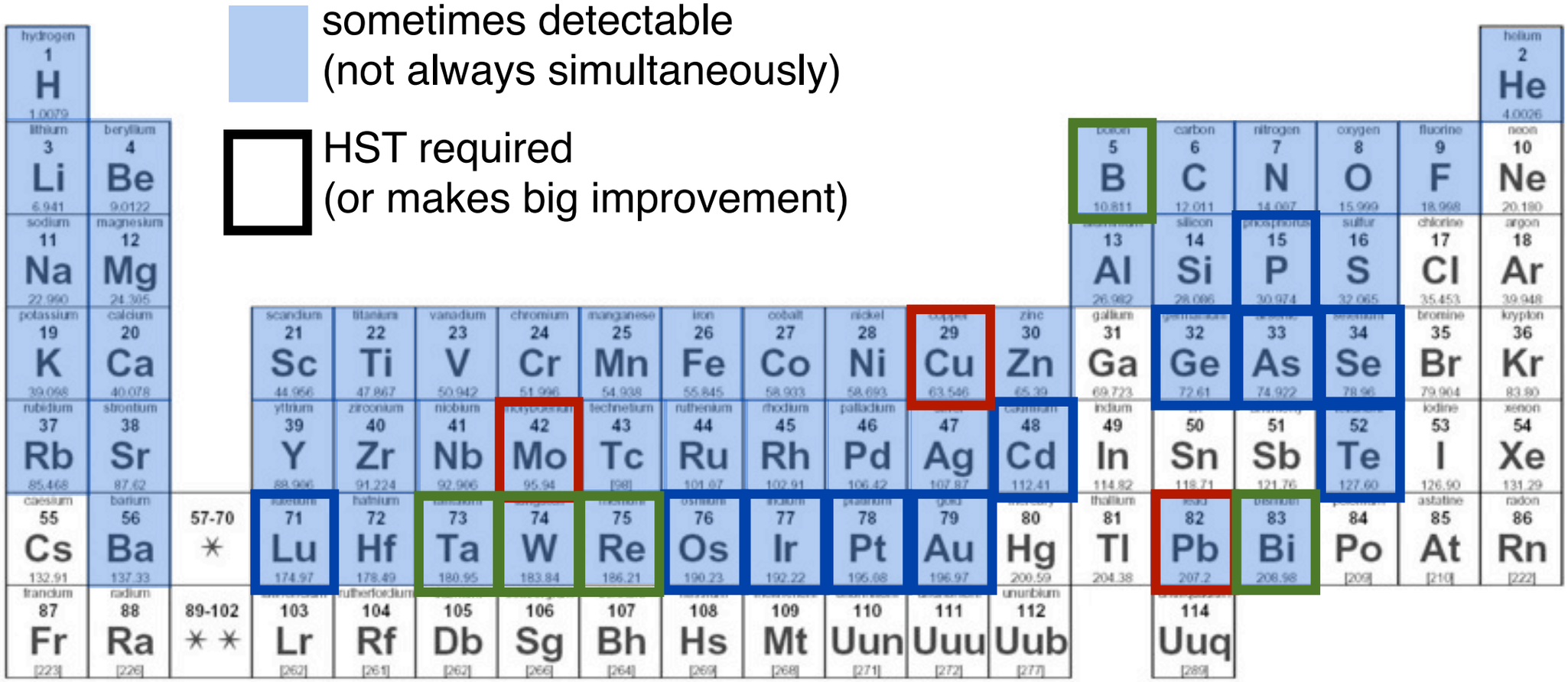
Russia manufactures the main instrument of the observatory - a 170-cm telescope to be equipped with high- and low-resolution spectrometers, long-slit spectrometer and cameras for high-quality UV and optical imaging. Astronomers are in great need of such an observatory.

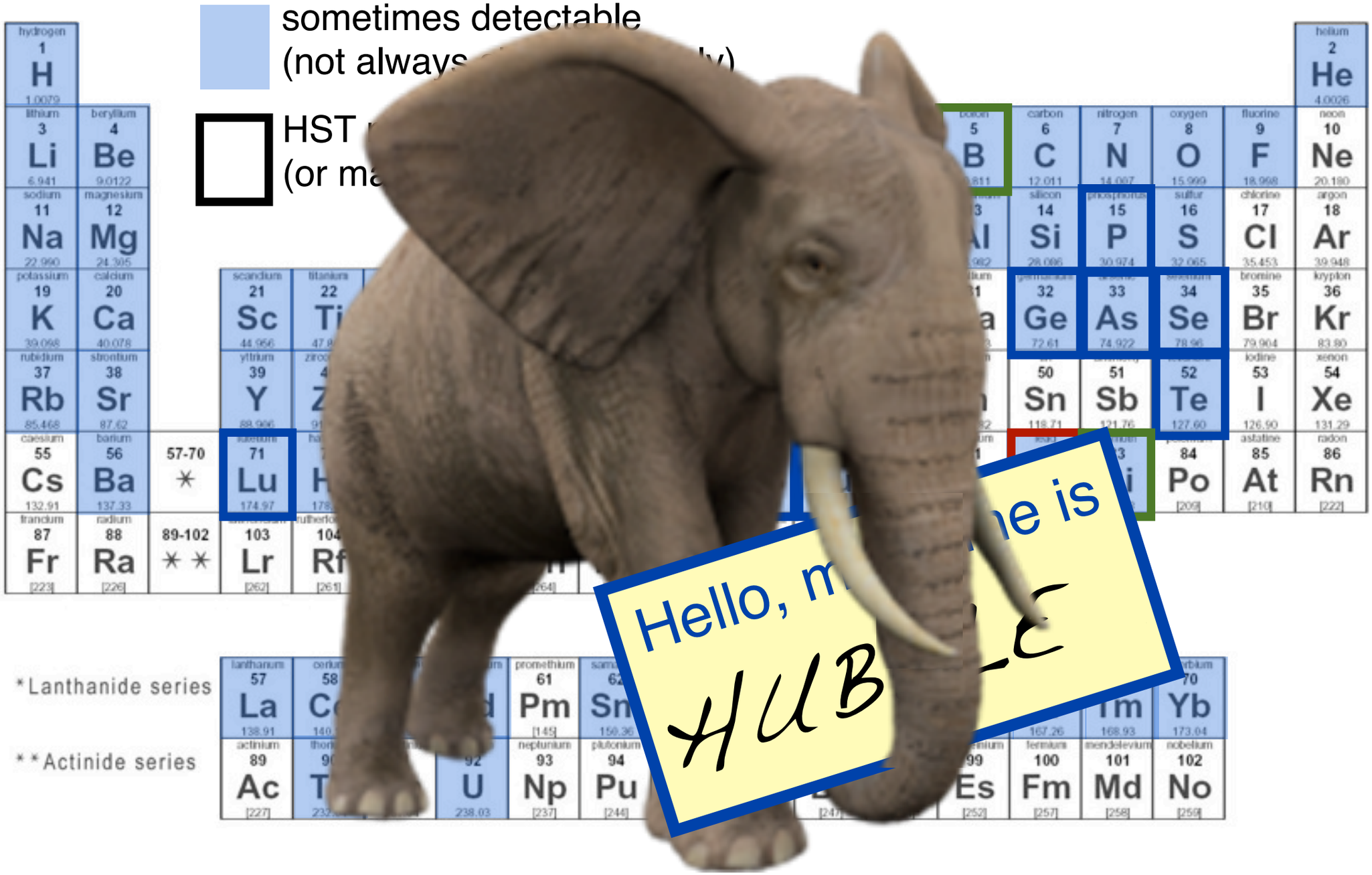
The Spanish participation is funded by the Ministry of Industry, Energy and Tourism (industrial activities) and the National Secretariat of Research, Development and Innovation (Ministry of Economy) (scientific activities) through the Spanish Space Plan. The Universidad Complutense de Madrid (UCM) is the scientific responsible for Spain.

By its potential, the WSO-UV mission is similar to the Hubble Space Telescope (HST), though it exceeds HST in spectroscopic capabilities. The WSO-UV project is based on an organizational concept having at its core to ensure the broadest possible international cooperation and provide the astronomical community with the most open access to observational facilities.

ROSCOSMOS

MINISTERIO
DE INDUSTRIA, ENERGÍA
Y TURISMO


sometimes detectable
(not always simultaneously)
HST required
(or makes big improvement)
hydrogen 1 H 1.0079
helium 2 He 4.0026
lithium 3 Li 6.941
beryllium 4 Be 9.0122
boron 5 B 10.811
carbon 6 C 12.011
nitrogen 7 N 14.007
oxygen 8 O 15.999
fluorine 9 F 18.998
neon 10 Ne 20.180
sodium 11 Na 22.990
magnesium 12 Mg 24.305
aluminium 13 Al 26.982
silicon 14 Si 28.086
phosphorus 15 P 30.974
sulfur 16 S 32.065
chlorine 17 Cl 35.453
argon 18 Ar 39.948
potassium 19 K 39.098
calcium 20 Ca 40.078
scandium 21 Sc 44.956
titanium 22 Ti 47.867
vanadium 23 V 50.942
chromium 24 Cr 51.996
manganese 25 Mn 54.938
iron 26 Fe 55.845
cobalt 27 Co 58.933
nickel 28 Ni 58.693
copper 29 Cu 63.546
zinc 30 Zn 65.39
gallium 31 Ga 69.723
germanium 32 Ge 72.61
arsenic 33 As 74.922
selenium 34 Se 78.96
bromine 35 Br 79.904
krypton 36 Kr 83.80
rubidium 37 Rb 85.468
strontium 38 Sr 87.62
yttrium 39 Y 88.906
zirconium 40 Zr 91.224
niobium 41 Nb 92.906
molybdenum 42 Mo 95.94
technetium 43 Tc [98]
ruthenium 44 Ru 101.07
rhodium 45 Rh 102.91
palladium 46 Pd 106.42
silver 47 Ag 107.87
cadmium 48 Cd 112.41
indium 49 In 114.82
tin 50 Sn 118.71
antimony 51 Sb 121.76
tellurium 52 Te 127.60
iodine 53 I 126.90
xenon 54 Xe 131.29
caesium 55 Cs 132.91
barium 56 Ba 137.33
57-70 *
lutetium 71 Lu 174.97
hafnium 72 Hf 178.49
tantalum 73 Ta 180.95
tungsten 74 W 183.84
rhenium 75 Re 186.21
osmium 76 Os 190.23
iridium 77 Ir 192.22
platinum 78 Pt 195.08
gold 79 Au 196.97
mercury 80 Hg 200.59
thallium 81 Tl 204.38
lead 82 Pb 207.2
bismuth 83 Bi 208.98
polonium 84 Po [209]
astatine 85 At [210]
radon 86 Rn [222]
francium 87 Fr [223]
radium 88 Ra [226]
89-102 * *
lawrencium 103 Lr [262]
rutherfordium 104 Rf [261]
dubnium 105 Db [262]
seaborgium 106 Sg [266]
bohrium 107 Bh [264]
hassium 108 Hs [269]
meitnerium 109 Mt [268]
ununnilium 110 Uun [271]
ununnilium 111 Uuu [272]
ununbium 112 Uub [277]
ununquadium 114 Uuq [289]
*Lanthanide series
lanthanum 57 La 138.91
cerium 58 Ce 140.12
praseodymium 59 Pr 140.91
neodymium 60 Nd 144.24
promethium 61 Pm [145]
samarium 62 Sm 150.36
europium 63 Eu 151.96
gadolinium 64 Gd 157.25
terbium 65 Tb 158.93
dysprosium 66 Dy 162.50
holmium 67 Ho 164.93
erbium 68 Er 167.26
thulium 69 Tm 168.93
ytterbium 70 Yb 173.04
* *Actinide series
actinium 89 Ac [227]
thorium 90 Th 232.04
protactinium 91 Pa 231.04
uranium 92 U 238.03
neptunium 93 Np [237]
plutonium 94 Pu [244]
americium 95 Am [243]
curium 96 Cm [247]
berkelium 97 Bk [247]
californium 98 Cf [251]
einsteinium 99 Es [252]
fermium 100 Fm [257]
mendelevium 101 Md [258]
nobelium 102 No [259]


sometimes detectable
(not always
HST
(or ma
Hello, m
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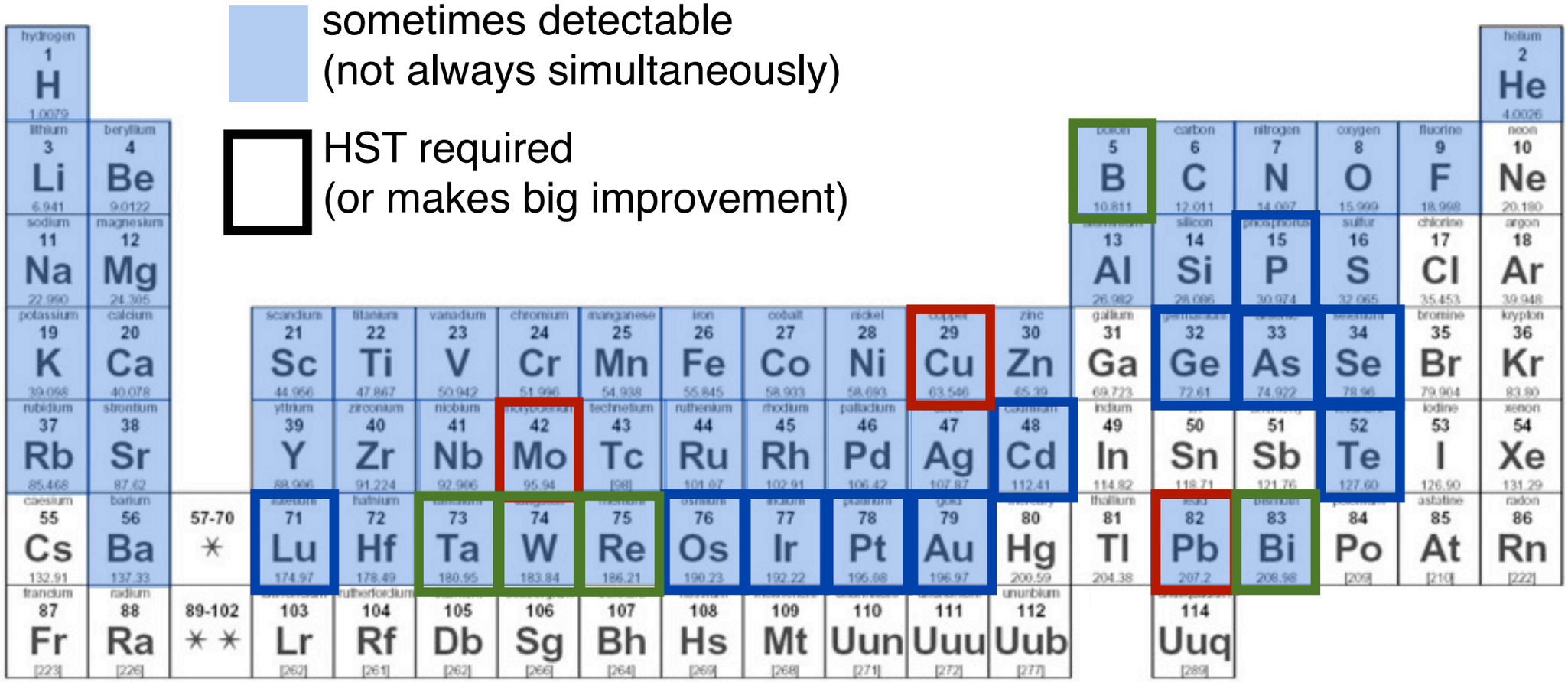
HUB
*Lanthanide series
**Actinide series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