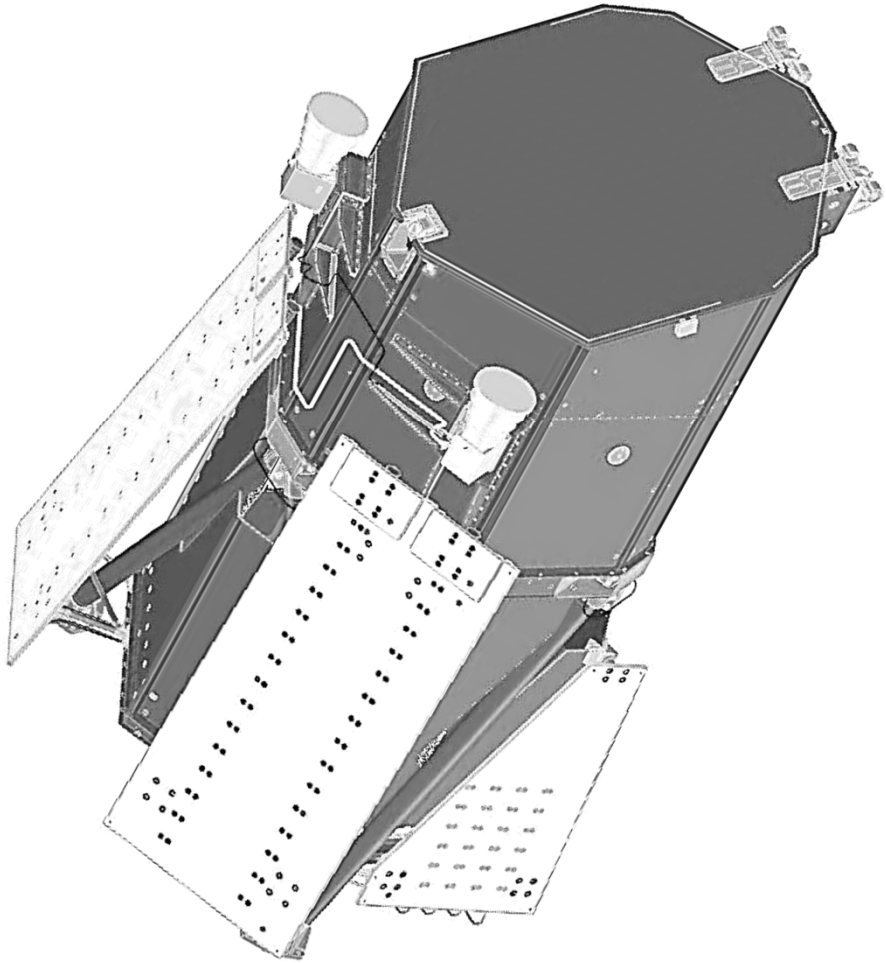
eROSITA

(extended) ROentgen Survey with an Imaging Telescope Array

Th. Boller on behalf of P. Predehl



History

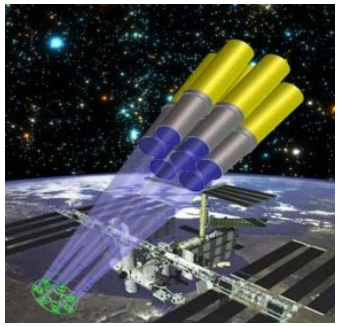
ROSAT 1990-1998

first X-ray all-sky survey
with an imaging telescope

ABRIXAS 1999

7 small telescopes to extend the all-sky survey towards higher energies

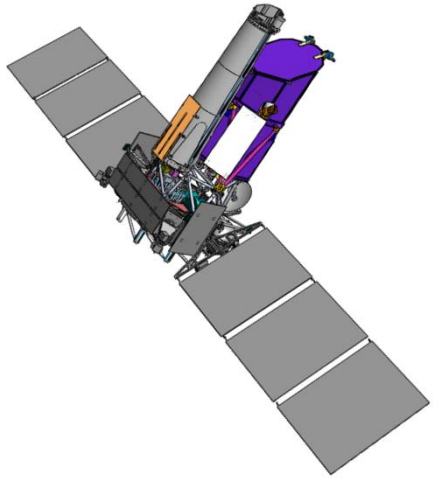
failed shortly after launch



ROSITA 2002

ABRIXAS science on the ISS

not realised due to Shuttle schedule

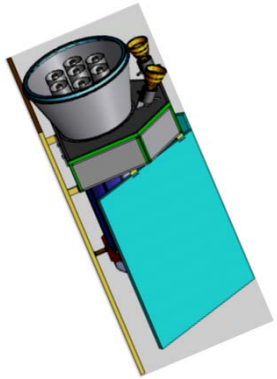


eROSITA 2014

on Russian SRG mission
10^5 Clusters of Galaxies
10^6 AGN

7 bigger mirror modules
extended field of view
completely funded

Launch in 2014

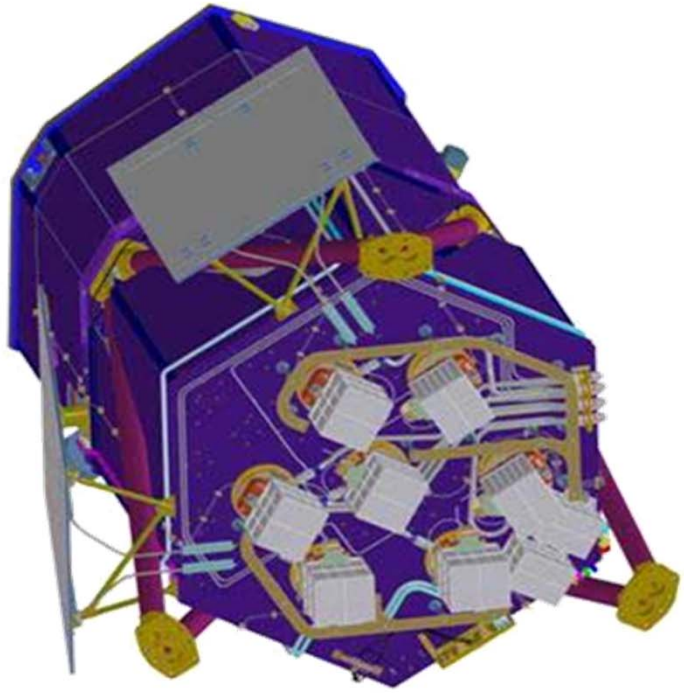


DUO 2004

Dark Energy
10^4 Clusters of Galaxies
SMEX-proposal

lost against NuStar

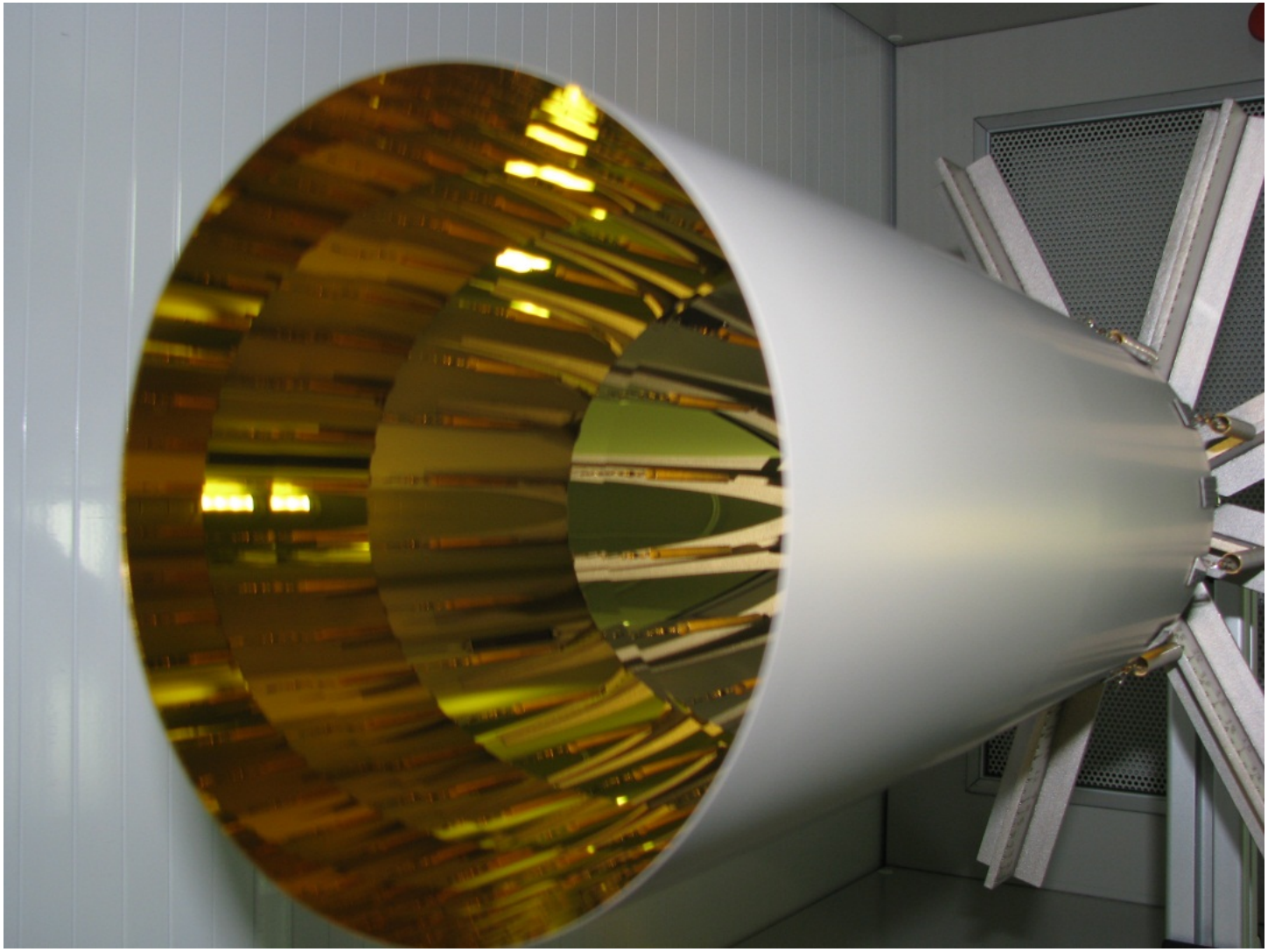
Instrument



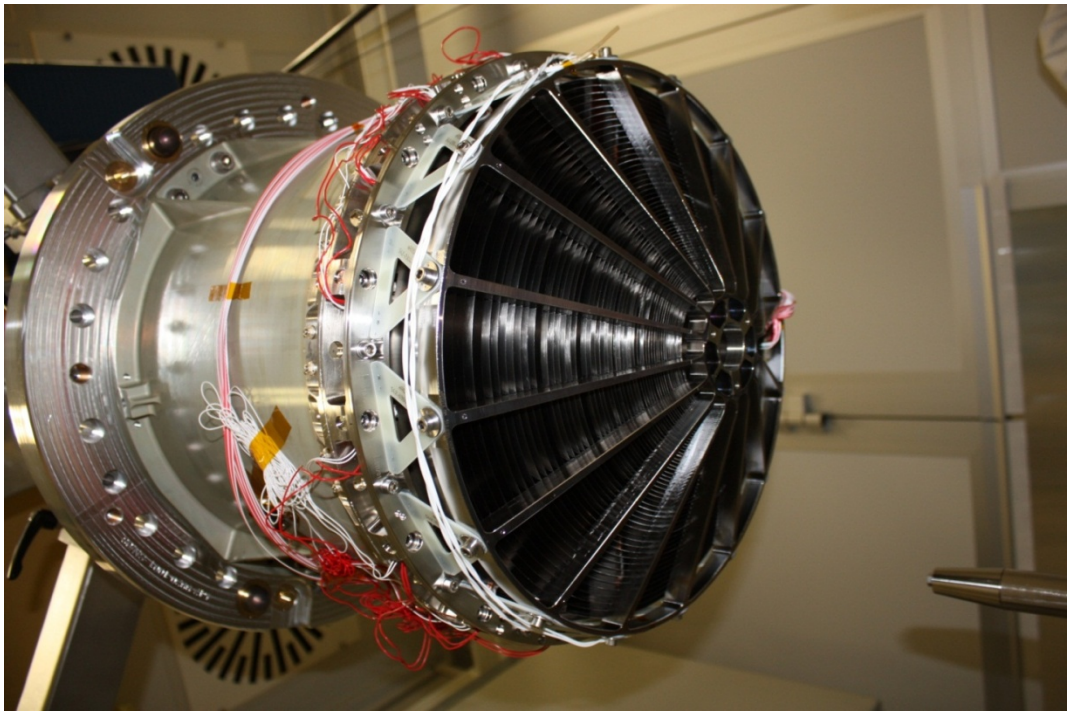
focal length	1,6 m
field of view	1° Ø
7 identical mirror modules	
54 nested mirror shells	

energy Range	0.3-10 keV
energy Resolution	138 eV @ 6 keV
dimensions	3,2m × 1,9m Ø
weight	~800 kg

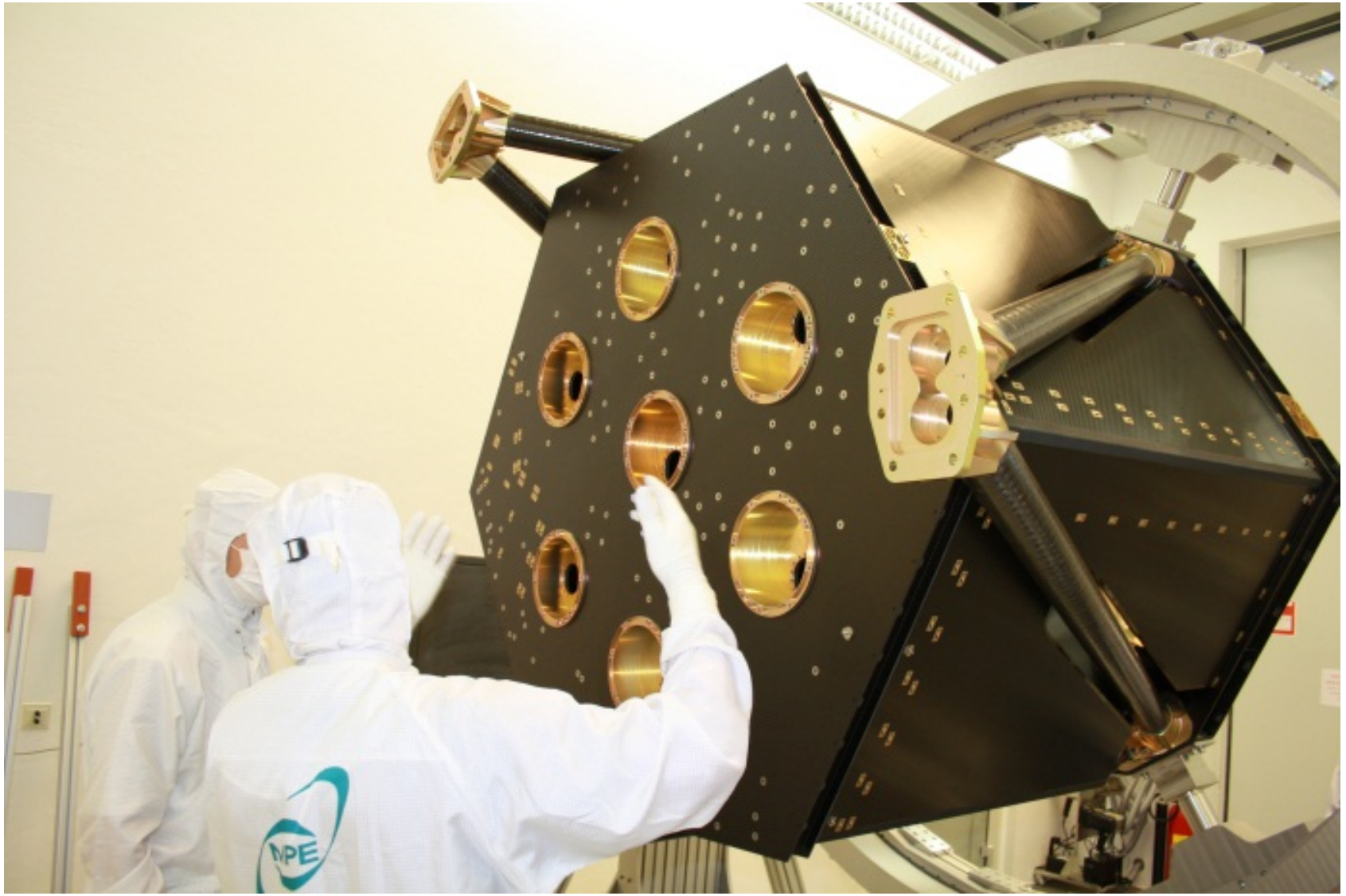
Mirrors



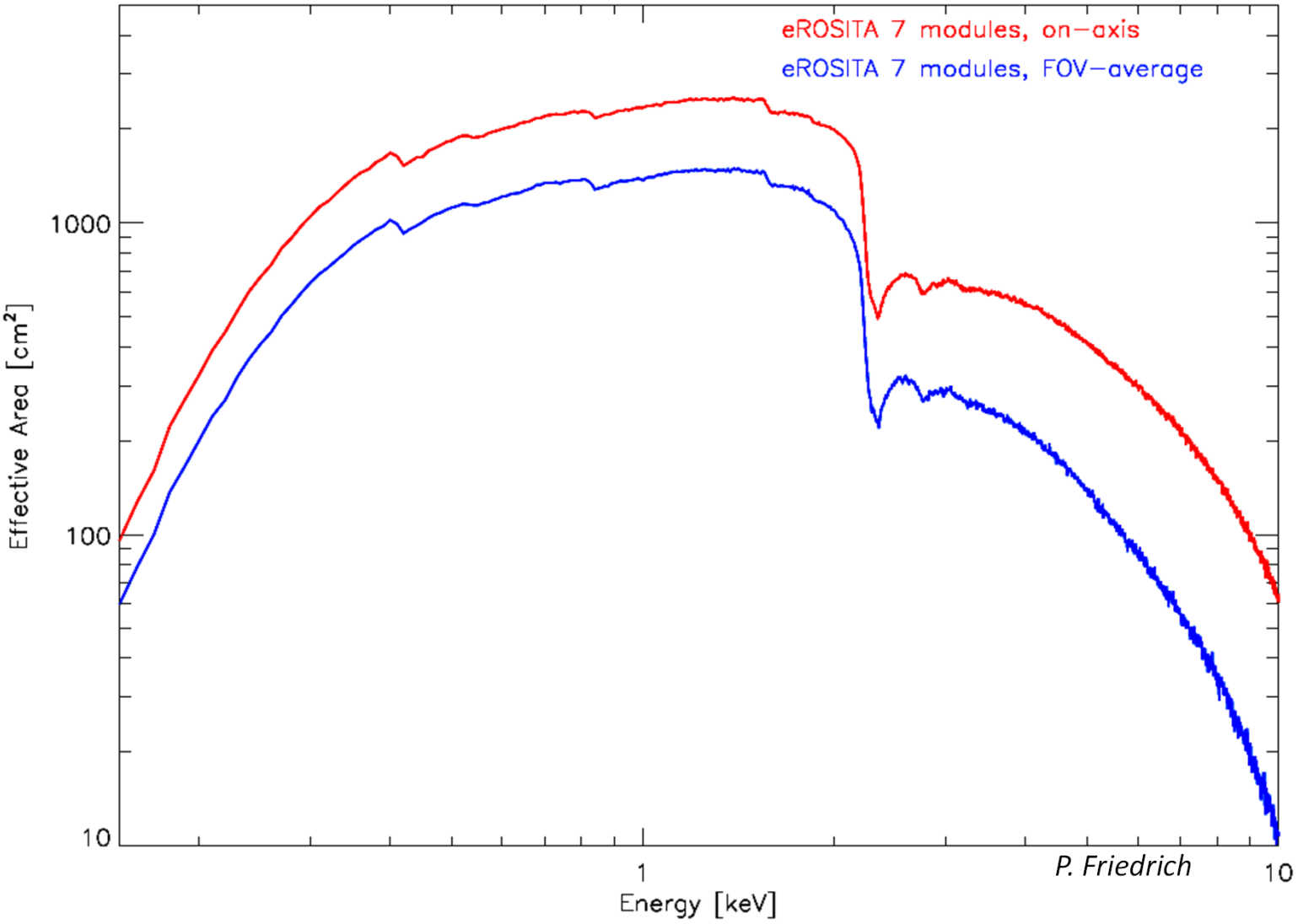
Mirrors tested at Panter



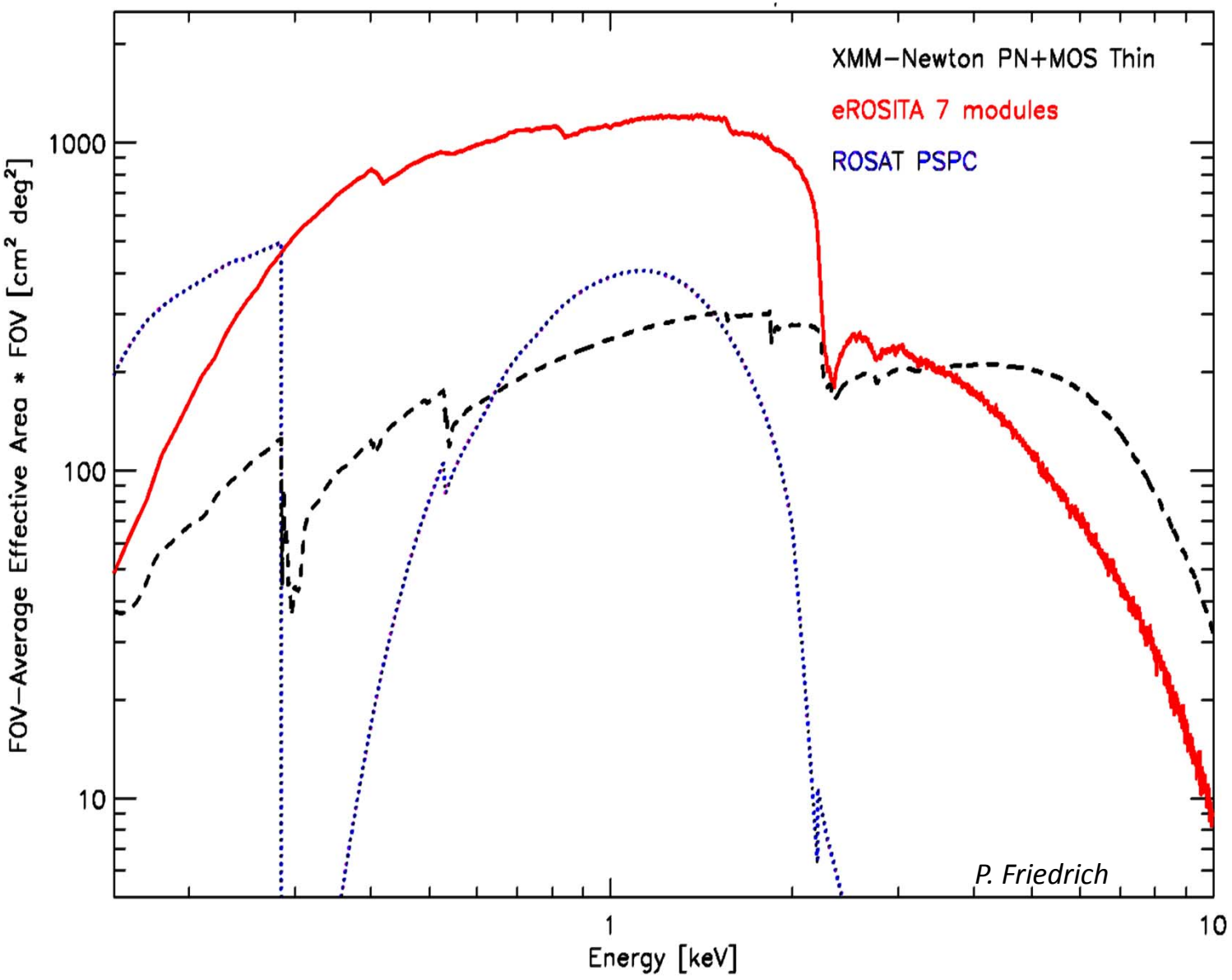
eROSITA in integration hall



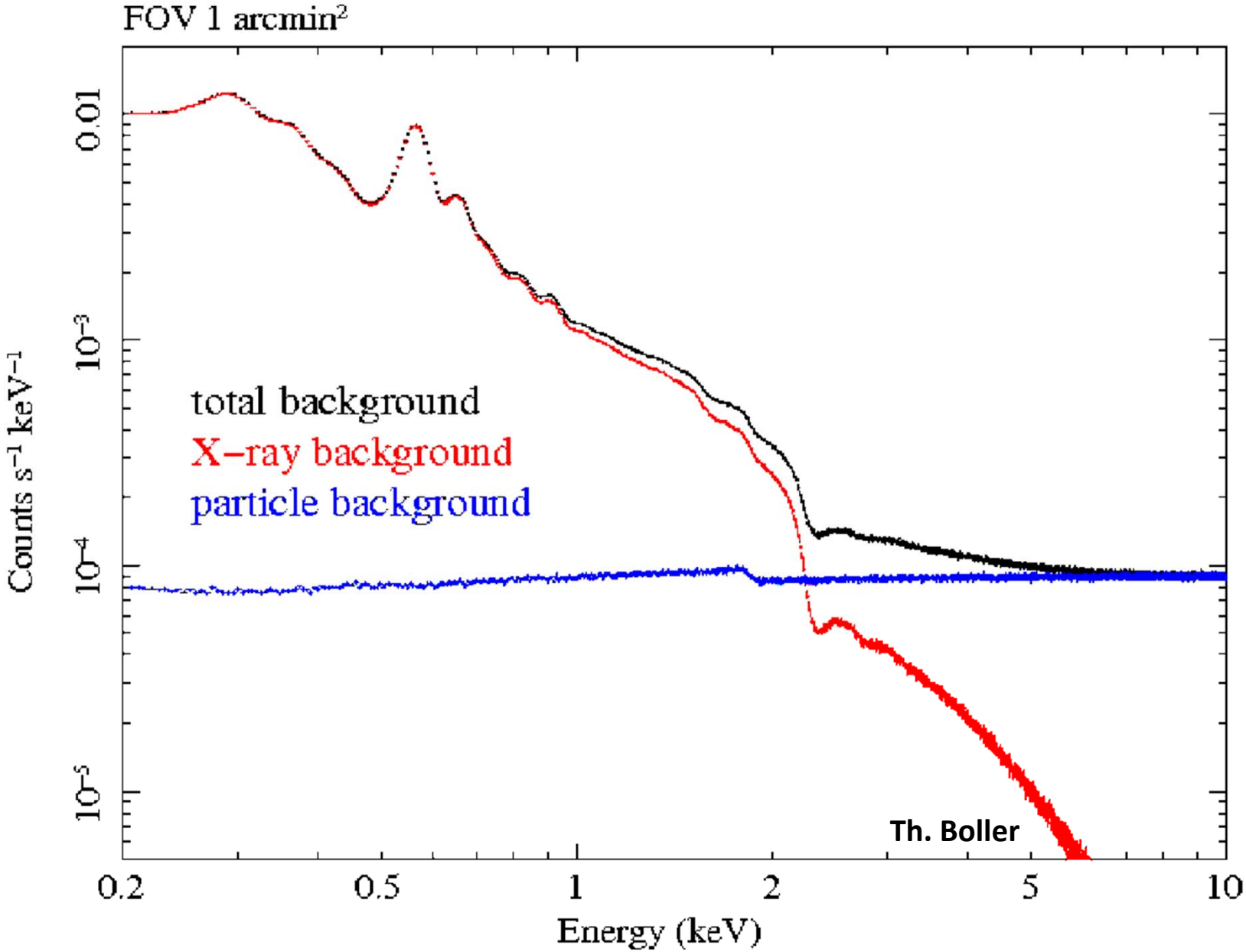
Effective area



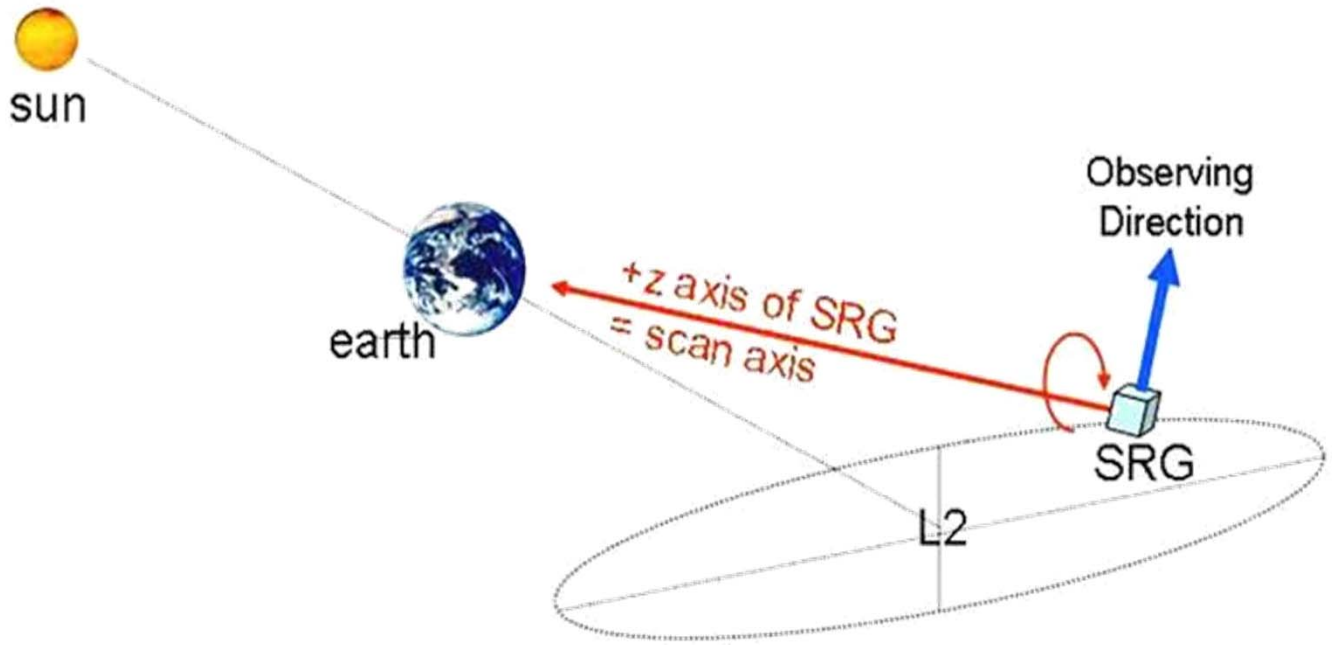
Grasp


XMM−Newton PN+MOS Thin
eROSITA 7 modules
ROSAT PSPC
FOV−Average Effective Area * FOV [cm² deg²]
1000
100
10
1
10
Energy [keV]
P. Friedrich

Background


FOV 1 arcmin²
Counts s⁻¹ keV⁻¹
0.01
10⁻³
10⁻⁴
10⁻⁵
total background
X-ray background
particle background
Th. Boller
0.2
0.5
1
2
5
10
Energy (keV)

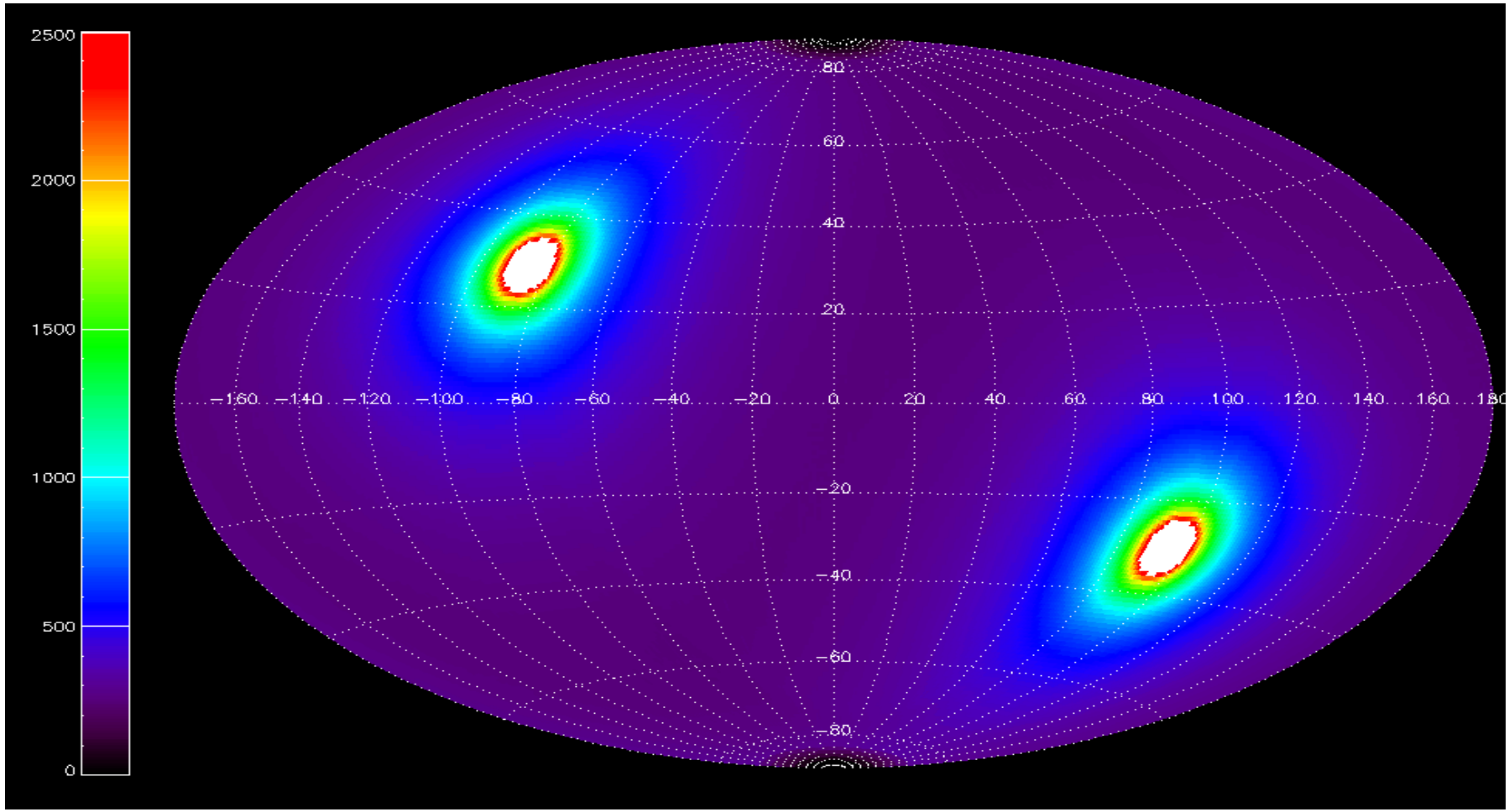
Mission profile



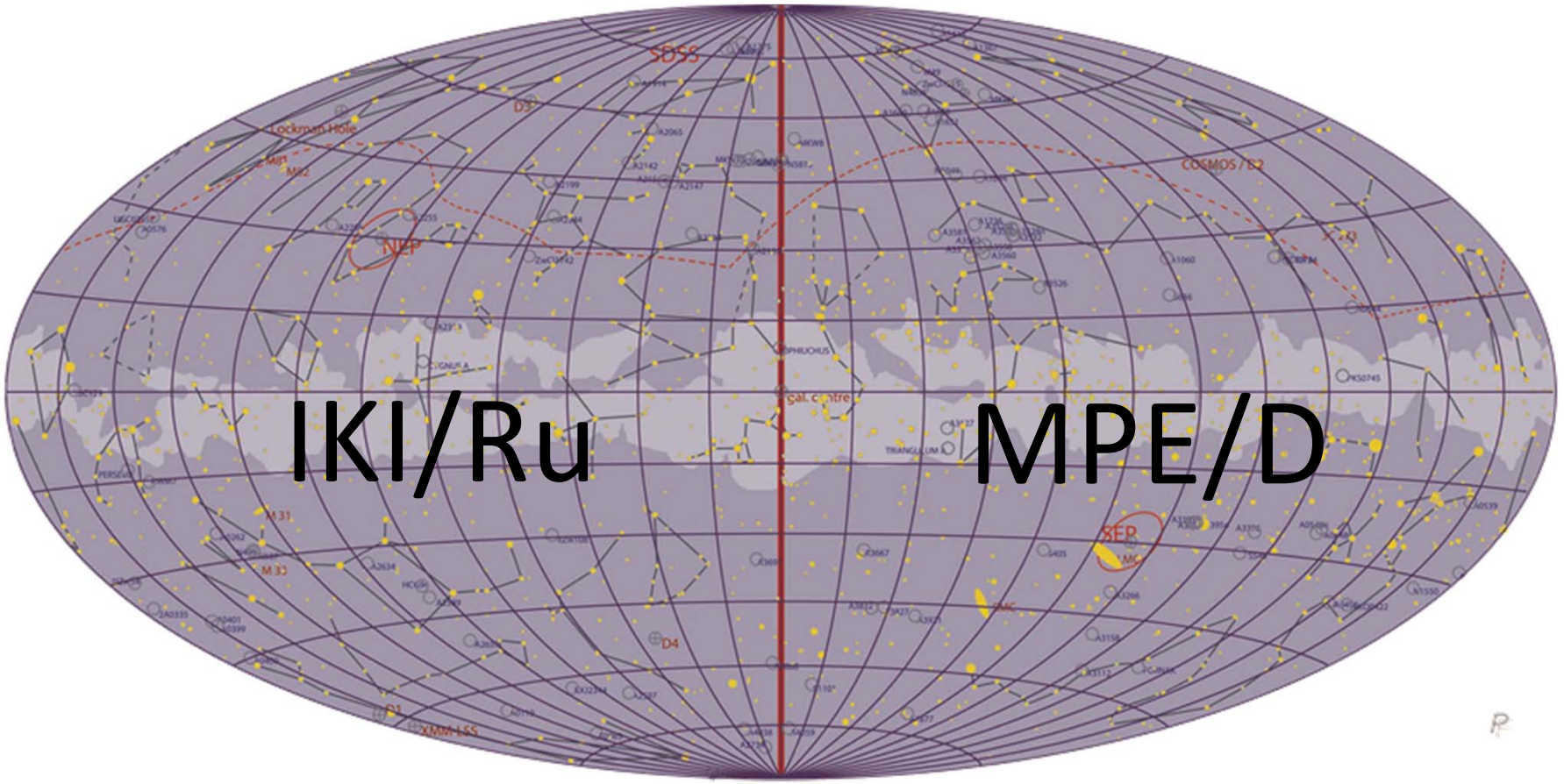
L2 orbit

4 years of survey operations
3 years pointed observations

Exposure Map



Sky devision



eROSITA Science

eROSITA will observed

- more than 1 million X-ray emitters
- constraining the cosmic evolution of active galaxies to z=5

eROSITA will perform a galaxy cluster survey

- will measure the evolution of galaxy population in clusters
- will measure the cluster mass evolution
- will provide competitive constraints on Dark Energy evolution

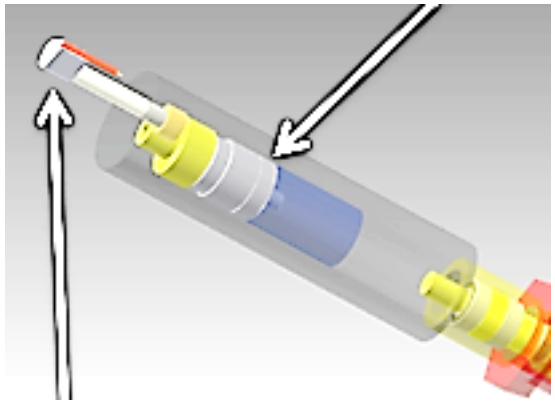
Optical follow-up with 4MOST

4m class Telescope (VISTA selected on May 30, 2012)

3deg^2+ FOV (wide-field corrector needed)

1500+ fibers
both low res (R =3000+) and high res (R=18000+) capabilities

PotzPoz



MuPoz

eROSITA

let´s go for a successful launch in 2014