I spent a lot of time with Neil in 1991 when I was a Lindsay Lecturer of NASA Goddard Space Flight Center. Neil was responsible for my visit.

We met many times before and after on different occasions.

He was really great in his position of a person responsible for SWIFT spacecraft and representing NASA in INTEGRAL.

Neil was one of the most visible scientists in the field of High Energy Astrophysics.

He was strong as a professional, very reliable and always friendly and positive to his colleagues, friends and young scientists. This Meeting demonstrates how many friends he had.

Rashid Sunyaev
Max-Planck Institute for Astrophysics, Garching
Space Research Institute, Moscow
Institute for Advanced Study, Princeton
I met several times prof. Tom Gehrels, father of Neil.

It was a surprize for me when I was informed by IAU that one asteroid has now name „11759 Sunyaev“. This was absolutely unexpected.

Later I recognized that this asteroid was discovered by Tom Gehrels. Tom discovered more than 4000 asteroids and small planets. It is interesting to see the list of names of these celestial bodies in Wikipedia paper “Discoveries by Tom Gehrels”.

Among them are:
1777 Gehrels
18241 Genzel
12146 Ostriker
11755 Paczynski
18242 Peebles
5451 Plato
4587 Rees
5450 Sokrates
11759 Sunyaev
2413 van de Hulst

And second paper of Neil was written together with his father.
Minor planets and related objects. XXVI - Magnitudes for the numbered asteroids
Gehrels T., Gehrels, N.
Our drama: great changes in the Soviet Union. Mission was delayed and canceled, when many devices were ready to fly.


Broad cooperation with UK, Denmark, Italy, USA, Israel, Germany, Turkey

PROTON launch was planned
New concept

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>1</td>
<td>Launch date</td>
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<td>2</td>
<td>Launch site</td>
<td>Baikonur</td>
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<td>3</td>
<td>Launch vehicles</td>
<td>“PROTON” - “Booster DM”</td>
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<tr>
<td>4</td>
<td>Operational orbit</td>
<td>L2 point</td>
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<tr>
<td>5</td>
<td>Active lifetime</td>
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<td>6</td>
<td>S/C dry mass</td>
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<td>7</td>
<td>Payload</td>
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<tr>
<td>8</td>
<td>S/C wet mass</td>
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<td>9</td>
<td>Radio line frequency range</td>
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<td>Data Transmission Rate</td>
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<td>11</td>
<td>Payload power consumption</td>
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</table>

Main scientific goal: 4 years of all sky survey (8 times) with 25“ angular resolution (detectors - X-Ray CCDs, grazing incidence optics)
eRosita Flight Mirror System

MPE, Garching
Flight unit of eRosita under assembling
AGN

3 Mio. AGN

- Accretion History:
- LSS:
- AGN host Galaxies:
- Sub-Populations:
  - High Redshift (z>6)
  - Extreme Luminosity
  - Compton thick AGN
- Spectra:
- Variability:
- BAOs

XLF, obscured vs. unobscured
AGN ACF, AGN/Galaxy CCF, AGN/Cluster CCF
Morphology, SFR, Obscuration

Baryonic Acoustic Oscillations

Obscuration, Continuum, Soft Excess, Iron Lines
Var. vs. L, L/L_{edd}, z, Tidal Disruptions
10σ detection, but precise redshifts needed.

10 thousand star forming galaxies

~10 thousand elliptical galaxies
(Low mass X-Ray binaries)

10 thousand star forming galaxies

~10 thousand elliptical galaxies
(Low mass X-Ray binaries)
OSITA sensitivity to variables

Expect 1000’s of TDE over 4 years (Khabibullin et al. 2013)
Clusters of galaxies – knots in the cosmic web

Thousands of galaxies with $v \sim 1000$ km/s
Hot intergalactic gas with $T_e \sim 3 – 10$ KeV

Distant galaxies are gravitationally lensed
Cluster of galaxies RX J1347.5–1145, discovered by ROSAT in X-Rays. Images obtained by ALMA (microwave) and HST (optics).
Competition with ground based instruments: SPT and ACT (20,000 sq degrees and hundred of thousands of clusters and groups of galaxies). SRG – whole sky in X-Rays.

In 2017 SPT started 3G phase with 16,000 bolometers in the focal plane: goal: 4000 new discovered clusters on 2500 sq degrees.
Clusters of galaxies – knots in the cosmic web