

Current status of ESA's Space Situational Awareness Near-Earth Object programme

*Detlef Koschny,
European Space Agency,
Solar System Missions Division
Keplerlaan 1
NL-2201 AZ Noordwijk ZH
Detlef.Koschny@esa.int*

Reminder: The European SSA Programme
The SSA-NEO segment
Link to UN activities
Precursor service setup
Current status
Conclusions



What is Space Situational Awareness?

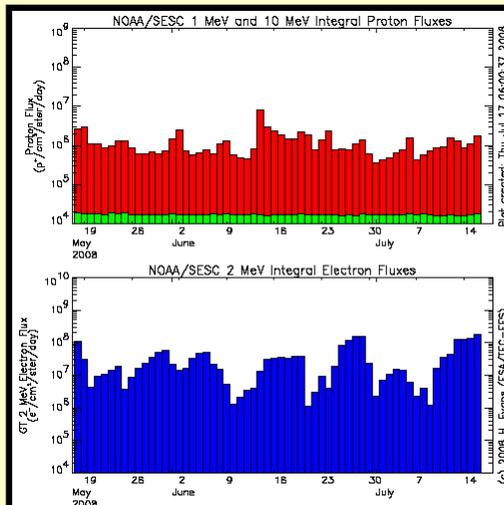
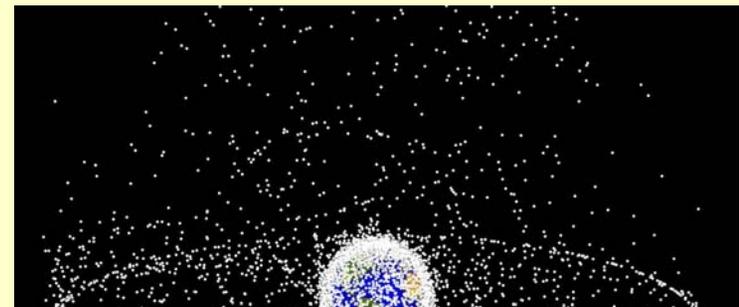
The objective of the Space Situational Awareness (SSA) initiative is to support the European independent utilisation of and access to space for research or services, through providing timely and quality data, information, services and knowledge regarding the environment, the threats and the sustainable exploitation of the outer space.

From the SSA Programme Declaration, ESA/C/SSA-PP(2008)2

The European SSA Programme

Three 'segments':

- Survey and Tracking (= Space Debris)
- Space Weather
- Near-Earth Objects



← Proton and electron fluxes (NOAA)



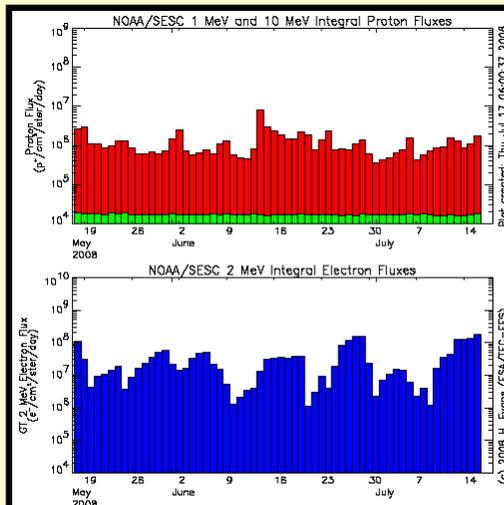
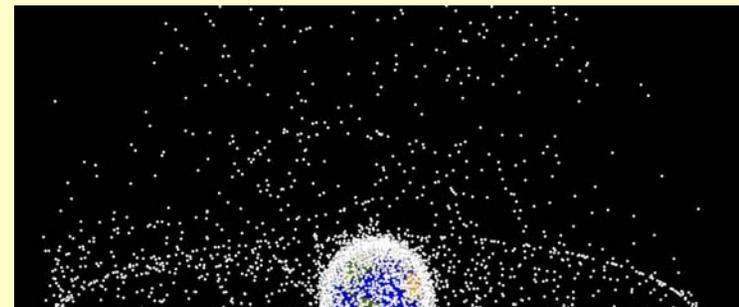
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ISS Station from 400 km, VSW Munich, 80 cm aperture

The European SSA Programme

- Preparatory phase (2009 – 2011) approved by ESA's Ministerial Council in Nov 2008 as an optional programme
- After confirmation: Nominal phase (10 years)



<- Proton and electron fluxes (NOAA)



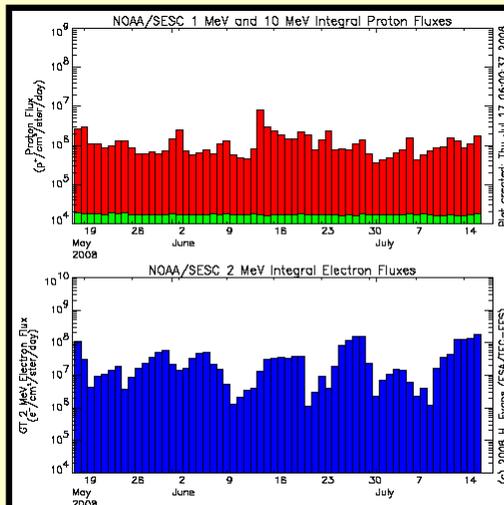
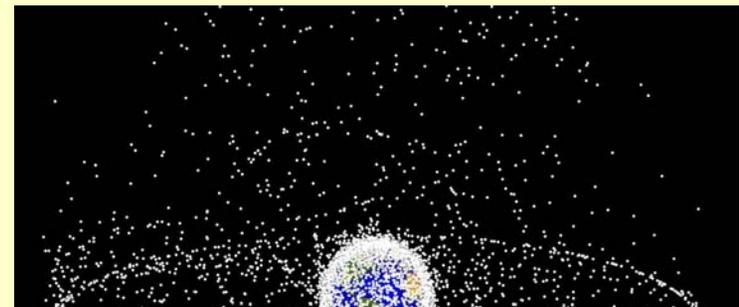
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ISS Station from 400 km, VSW Munich, 80 cm aperture

The European SSA Programme

- Network of sensors (ground- and space-based)
- Data centres
- Common data policy and standardization



<- Proton and electron fluxes (NOAA)

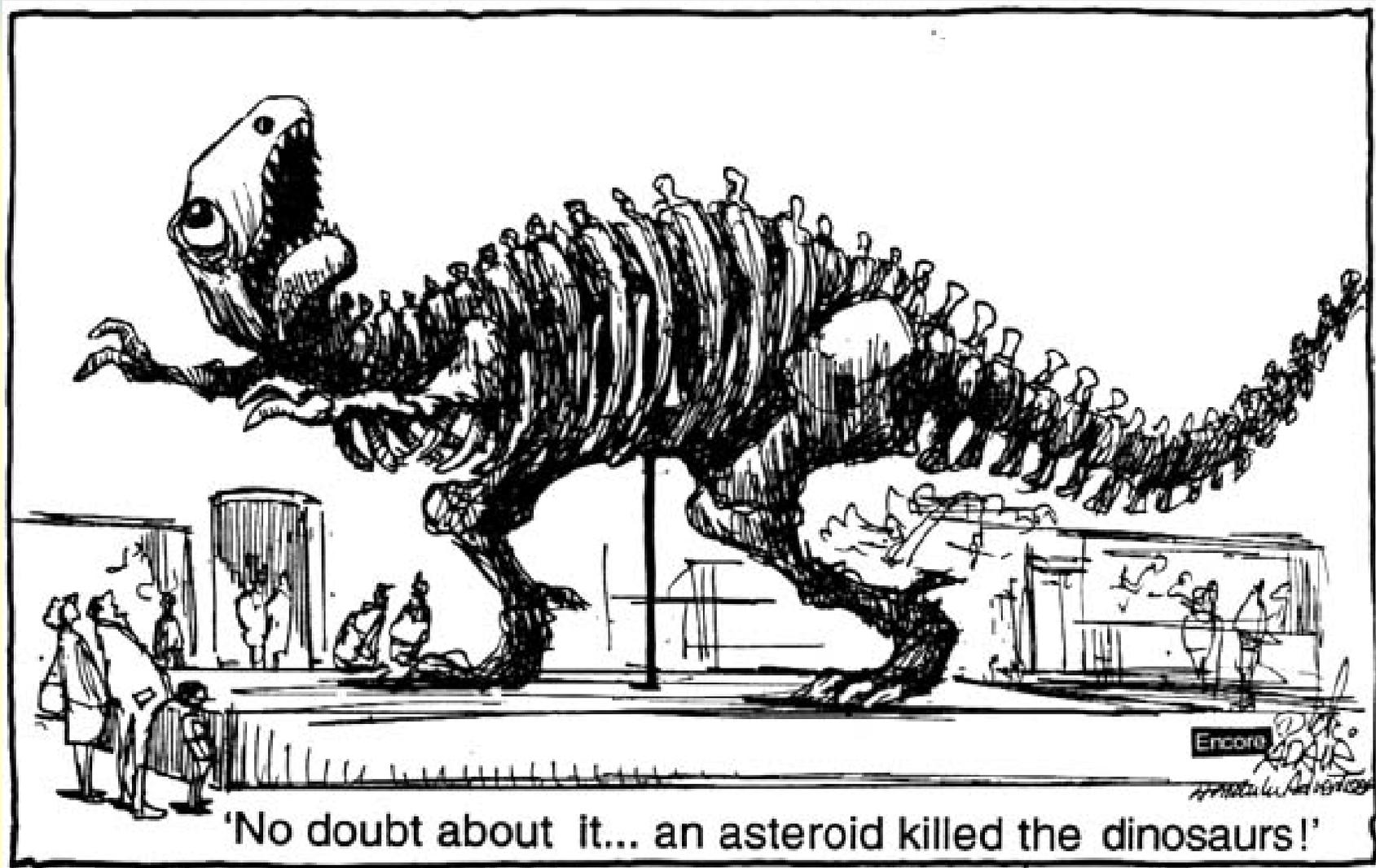


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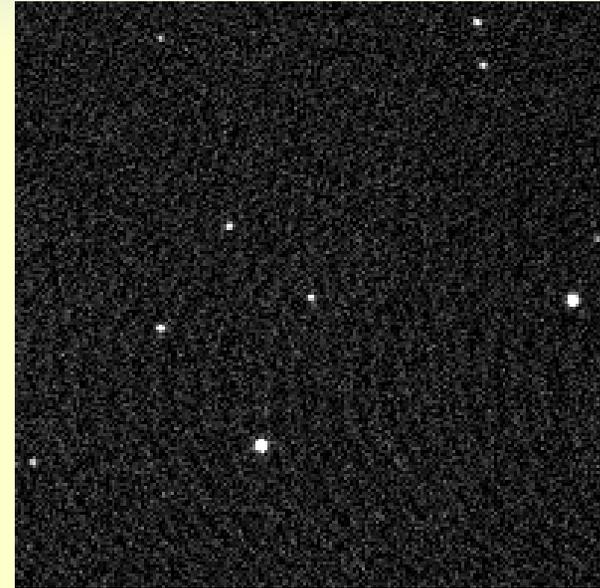
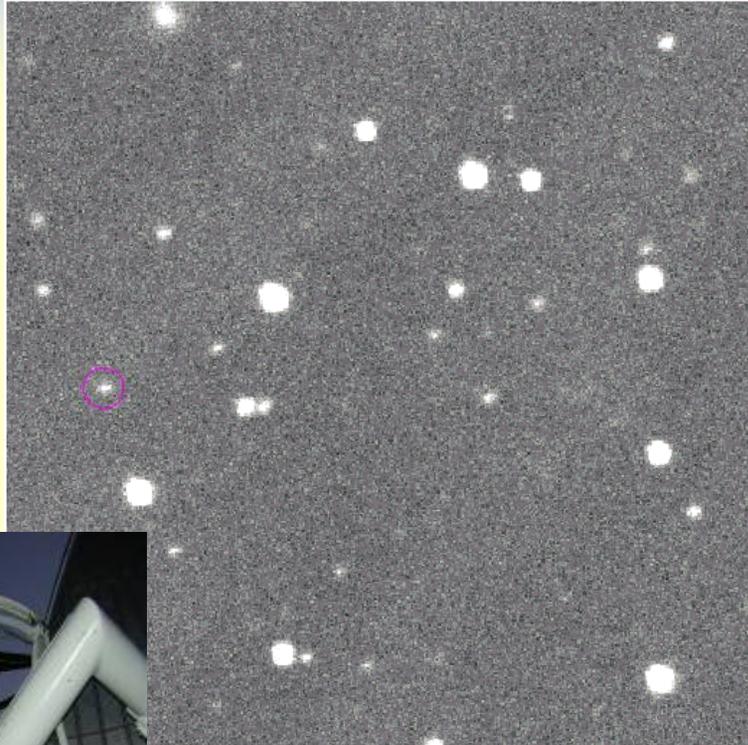


ISS Station from 400 km, VSW Munich, 80 cm aperture

Why should we care?



Sudan – 2008 TC3

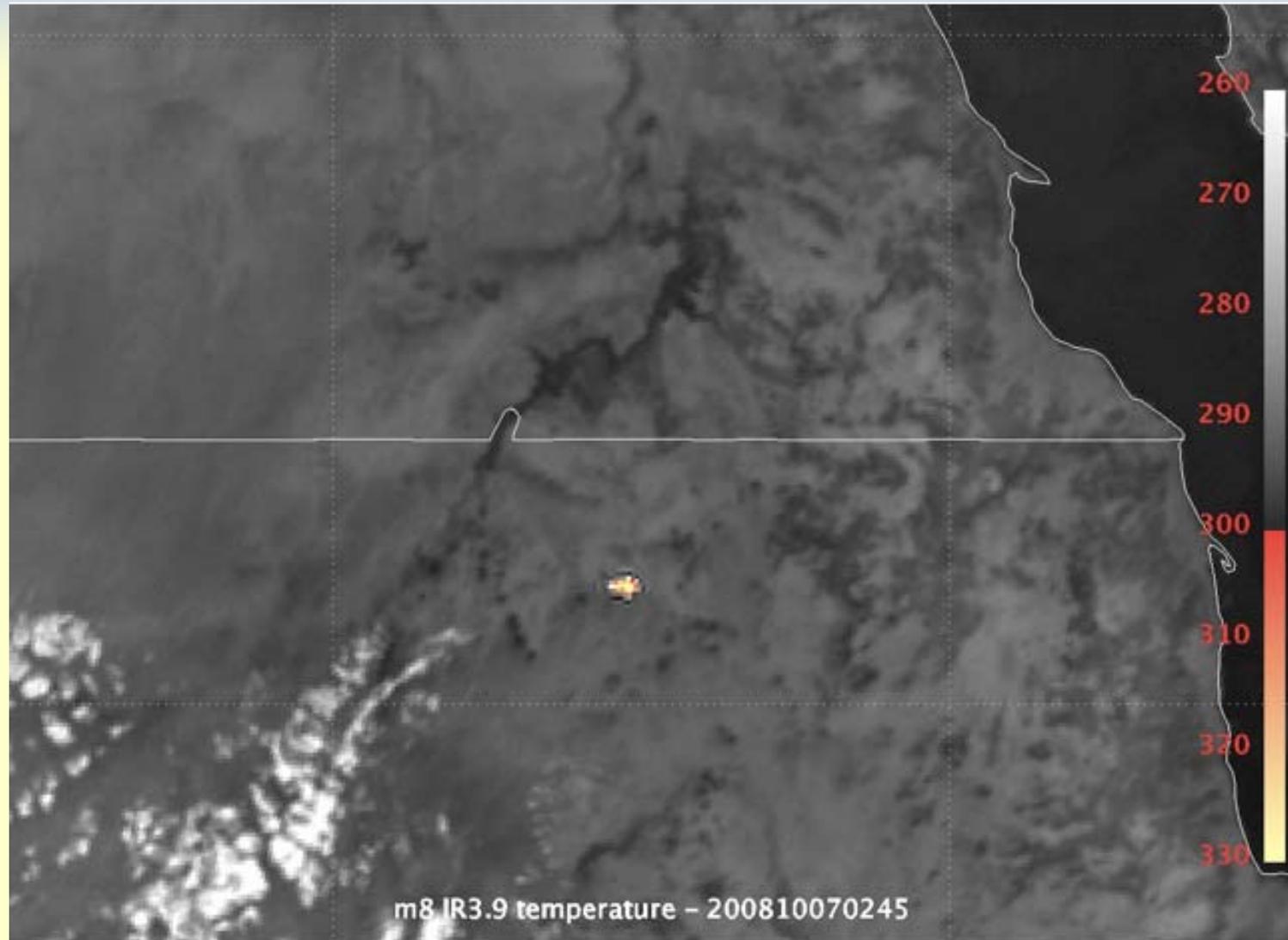


Discovery
Catalina Sky
Survey 06 Oct
2008 – impact in
19 h!

Great Shefford
Observatory
06 Oct 2008 –
impact in 3h16m



Sudan – 2008 TC3



Sudan - 2008 TC3

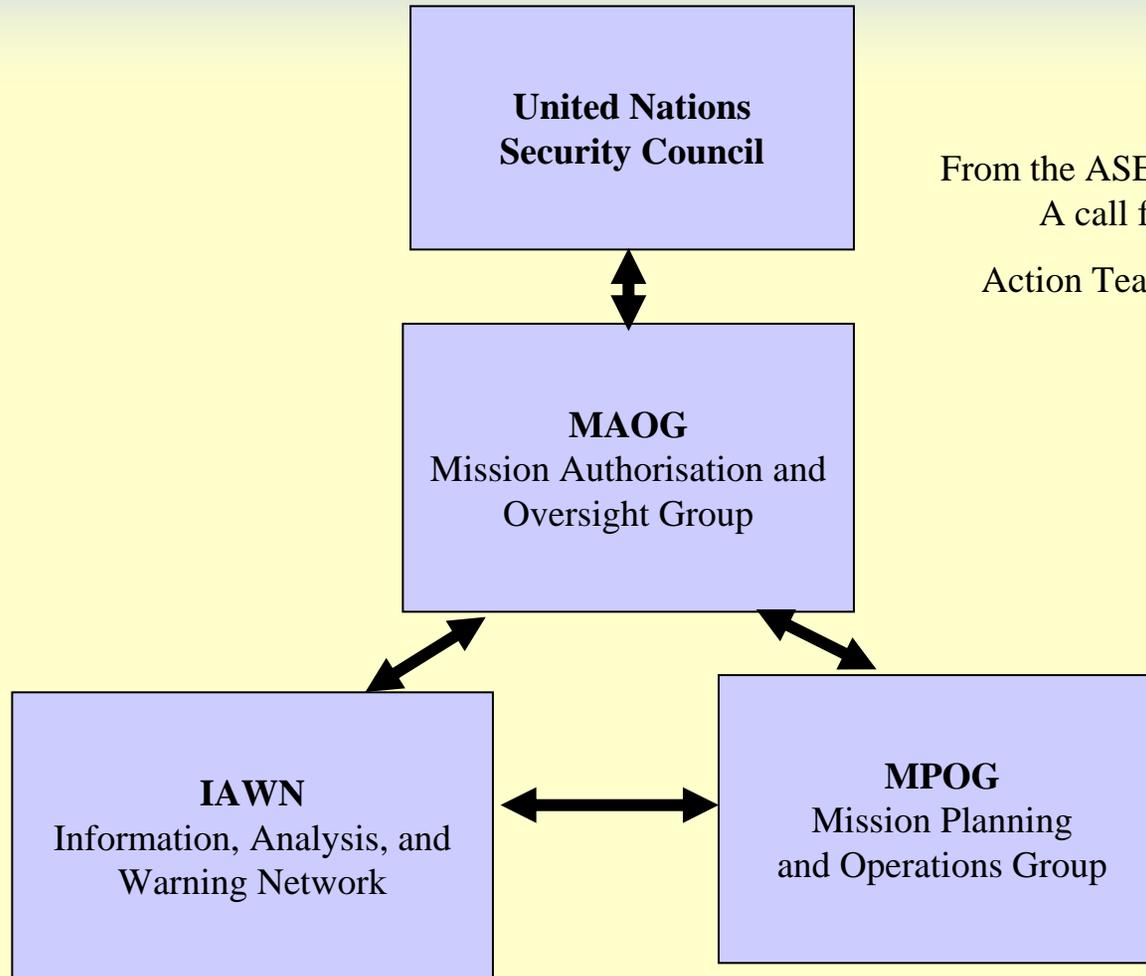


The European SSA-NEO segment - main requirements

The SSA-NEO segment shall provide information on the impact probability and/or miss distances of NEOs including associated uncertainties. To do this properly, it shall assess impact analyses, results, and perform its own impact risk assessments

Classify the risk of a NEO impact and issue warnings if the risk is higher than the background risk

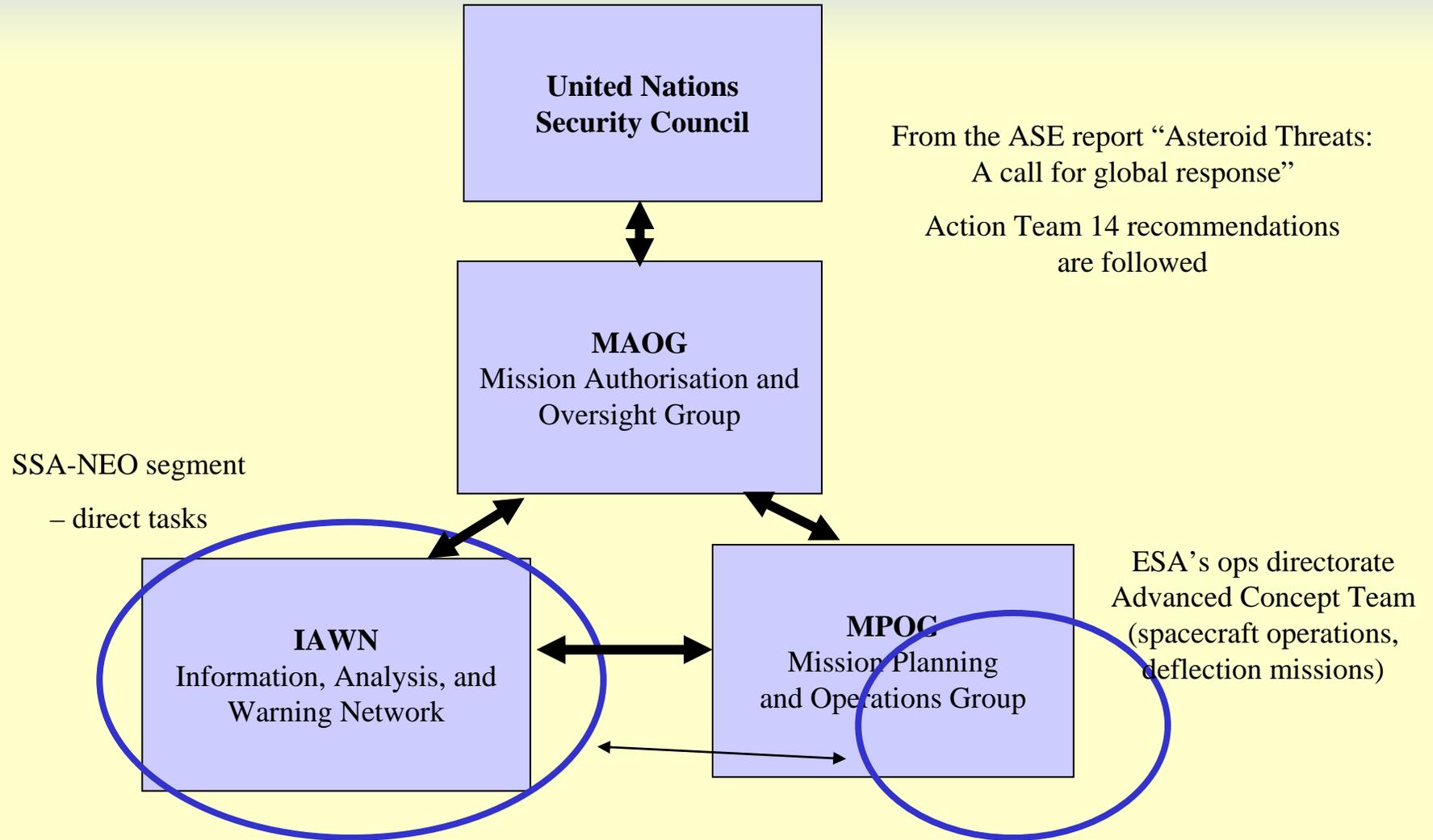
SSA-NEO – link to UN activities



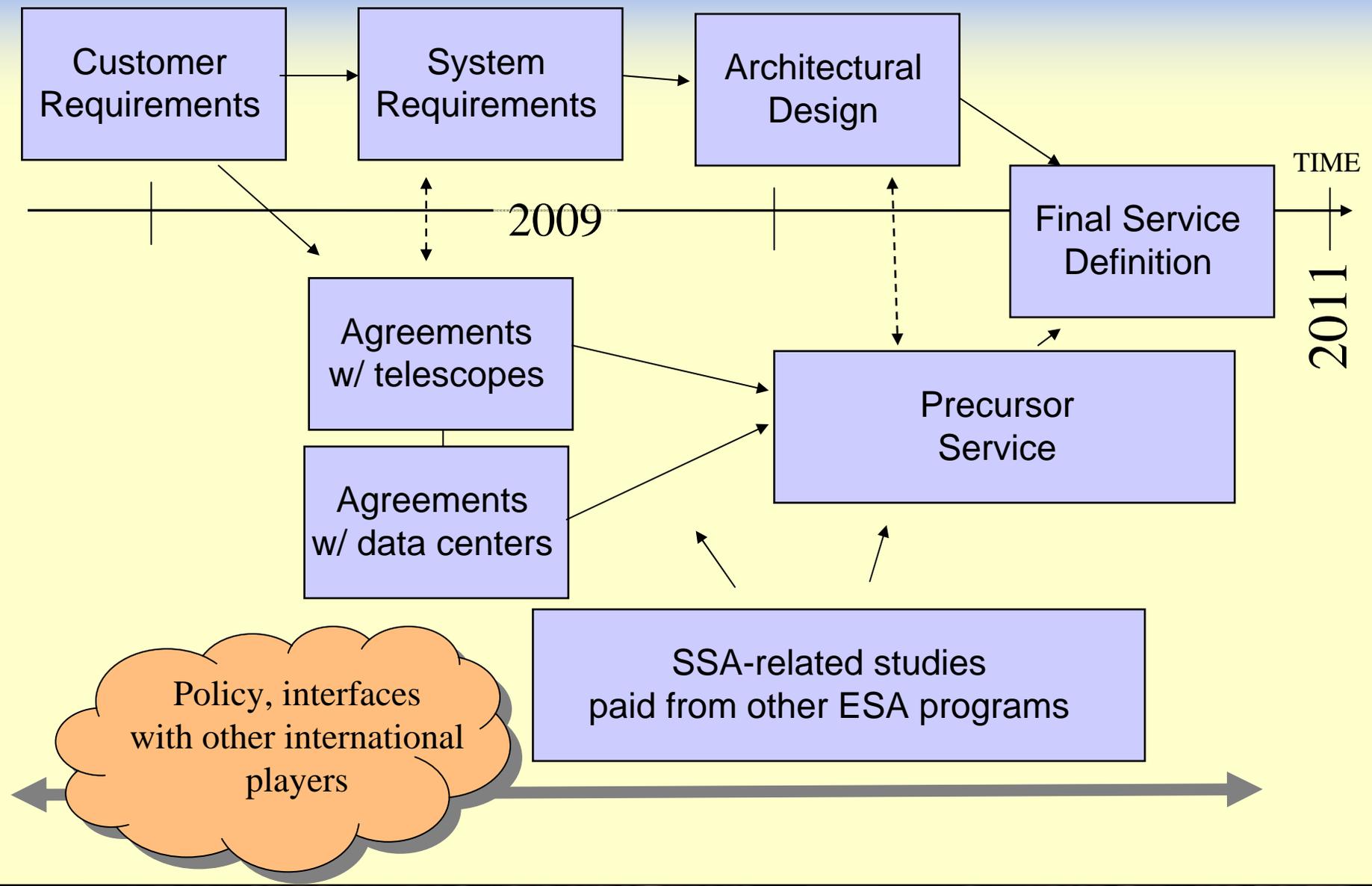
From the ASE report “Asteroid Threats:
A call for global response”

Action Team 14 recommendations
are followed

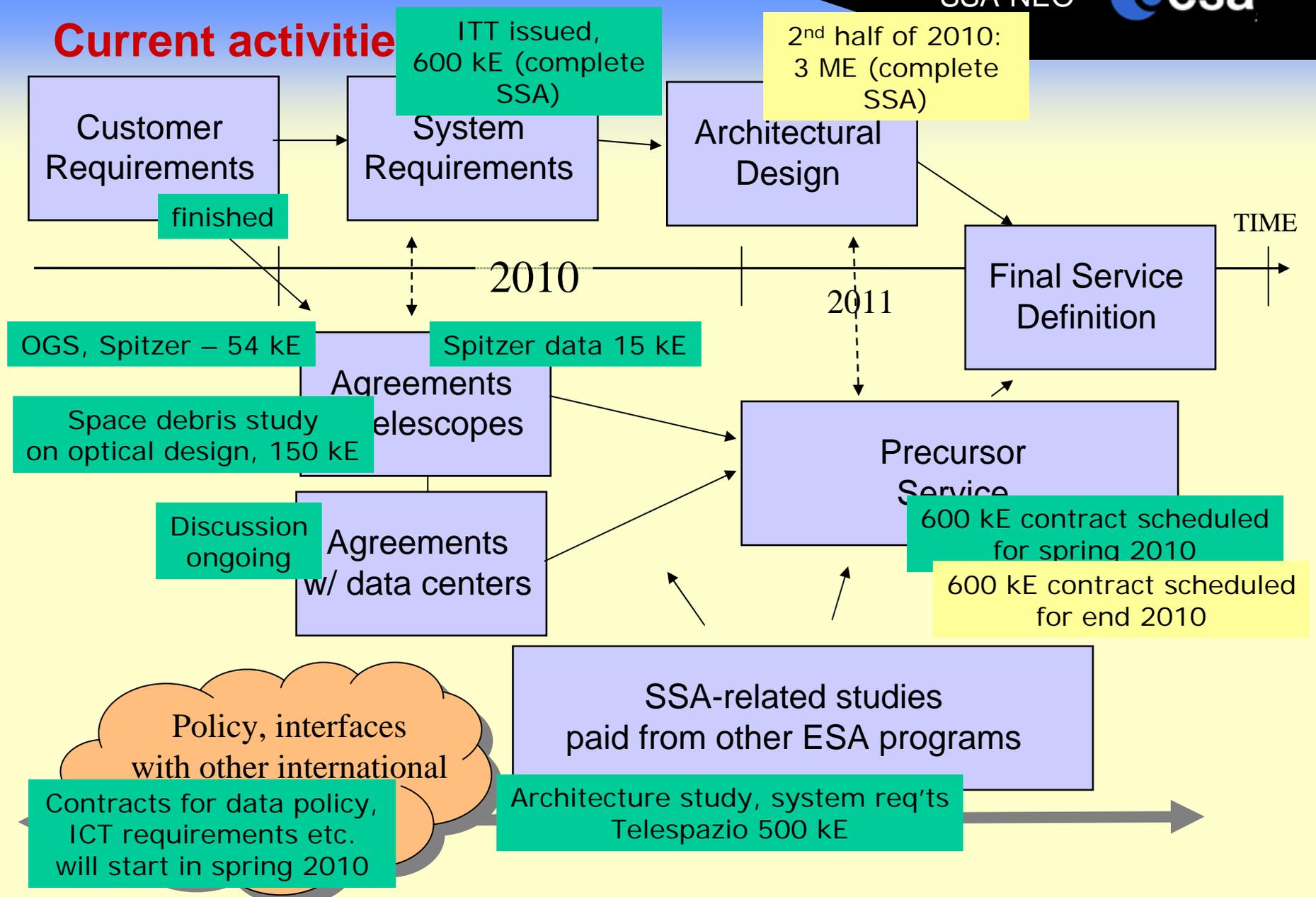
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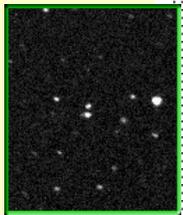
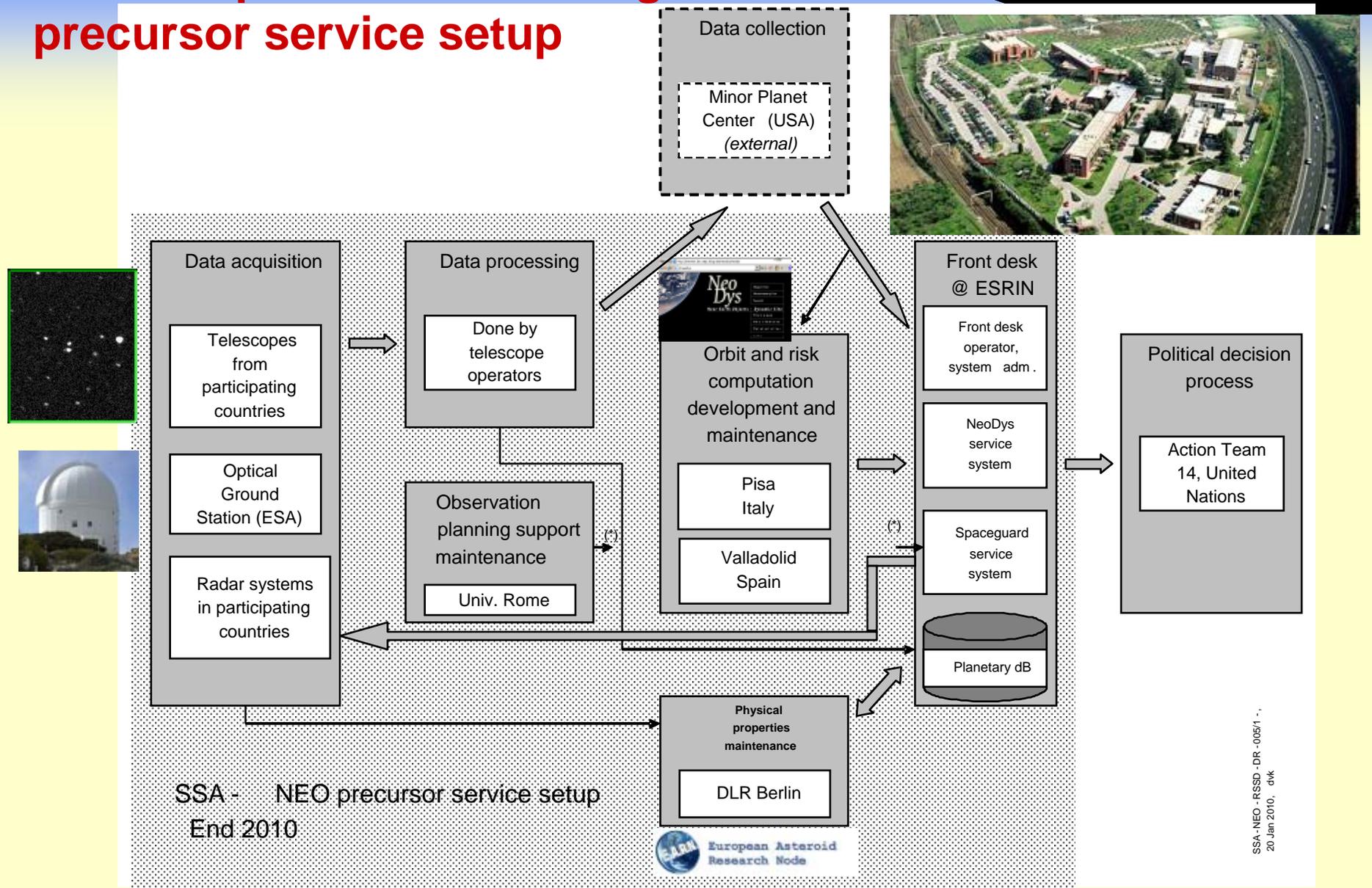
Current activities



Current activities



The European SSA-NEO segment precursor service setup



SSA-NEO-RSSD-DR-005/1 -
20 Jan 2010, drk

Ongoing activities

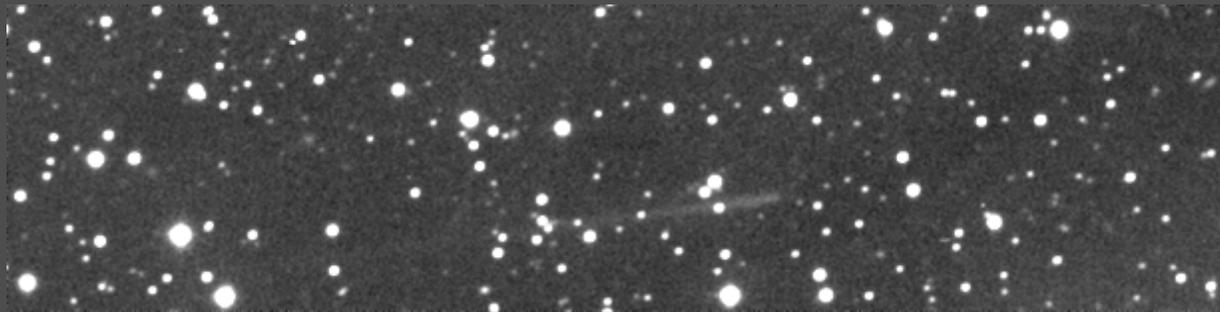
SSA-wide studies

- On data policy, computer infrastructure requirements, web design – **are approved and start now**
- Studies on optical telescopes, mainly for space debris application – also useful for NEOs

Directly linked to the NEO segment

- Study on requirements/architecture for NEO ground segment + test system **ongoing**
- Regular asteroid observations **have started** at Optical Ground Station (follow-up of objects on 'critical list'; physical characterisation; testing survey); support to science teams for Spitzer asteroid analysis
- ITT for contract to set up 'precursor service' will **come out** in spring 2010

2010A2 – an asteroid collision
imaged with the OGS telescope
06 Feb 2010



Approved studies from the 'General Studies' programme of ESA

- Study an alternative orbit propagator – **partially supported**
- Build a visible-infrared camera optimised for NEO observations at ground-based telescopes – **partially supported**
- Set up a robotic telescope demonstrator – **supported**



Conclusion

Europe has started to contribute to the efforts of setting up a proper impact threat warning system – several Mio Euros have been committed for the Space Situational Awareness programme with the NEO warning system being one of three segments

SSA-NEO should to be part of an UN-sanctioned world-wide system.

COPUOS can help by acknowledging the activity and comment on program contents – members of Action Team 14 are involved in the precursor service setup.

