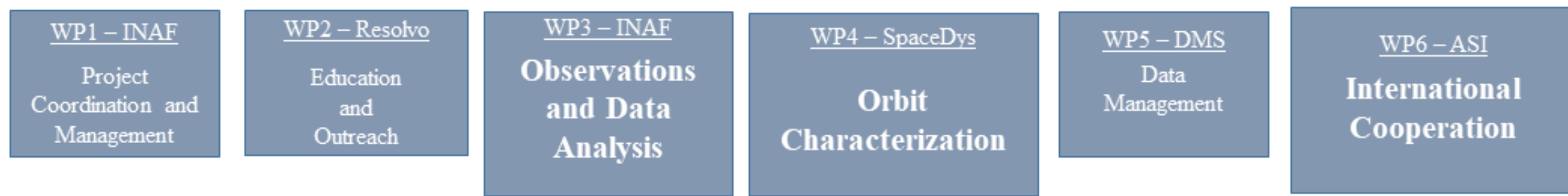


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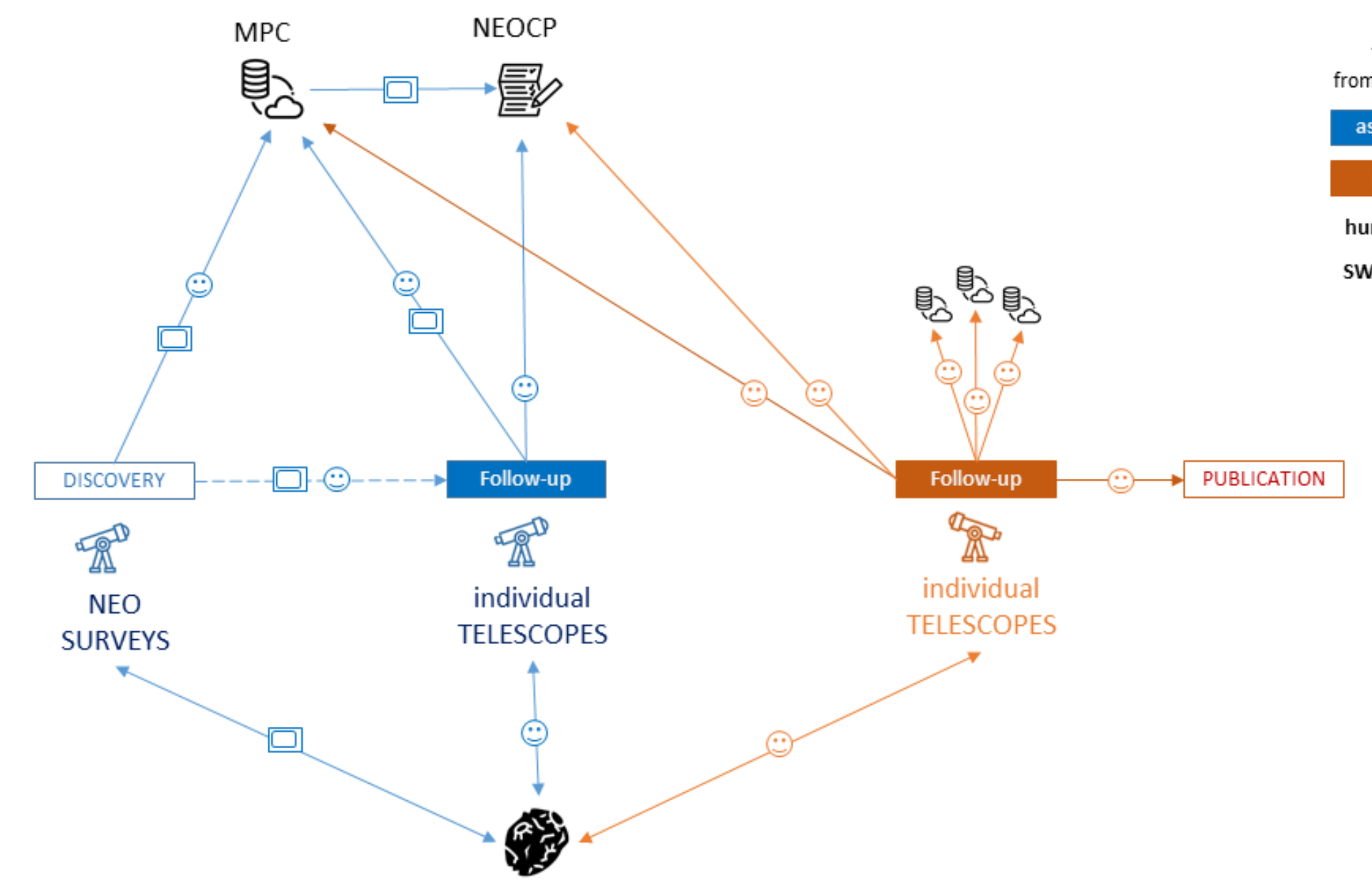
⁽¹⁾INAF-Osservatorio Astronomico di Roma, I, ⁽²⁾ASI-Agenzia Spaziale Italiana, I, ⁽³⁾DEIMOS Space, S, ⁽⁴⁾Space Dynamics Services s.r.l., I, ⁽⁵⁾IMCCE – Observatoire de Paris, F, ⁽⁶⁾Instituto de Astrofísica de Canarias, S, ⁽⁷⁾Astronomical Institute of the Romanian Academy, RO ⁽⁸⁾LESIA – Observatoire de Paris, F, ⁽⁹⁾Università di Padova, I, ⁽¹⁰⁾Gal Hassin Center, Isnello (PA), I, ⁽¹¹⁾Astronomický Ústav AV ČR, CZ, ⁽¹²⁾DEIMOS Space s.r.l., RO, ⁽¹³⁾NEOSPACE sp. z o.o., PL, ⁽¹⁴⁾Resolvo s.r.l., I, ⁽¹⁵⁾Observatoire de la Côte d’Azur, F, ⁽¹⁶⁾INAF – Osservatorio Astrofisico di Torino, I, ⁽¹⁷⁾DEIMOS Castilla La Mancha sl, S, ⁽¹⁸⁾University of Edinburgh, UK

Rapid Response Experiment: WBS



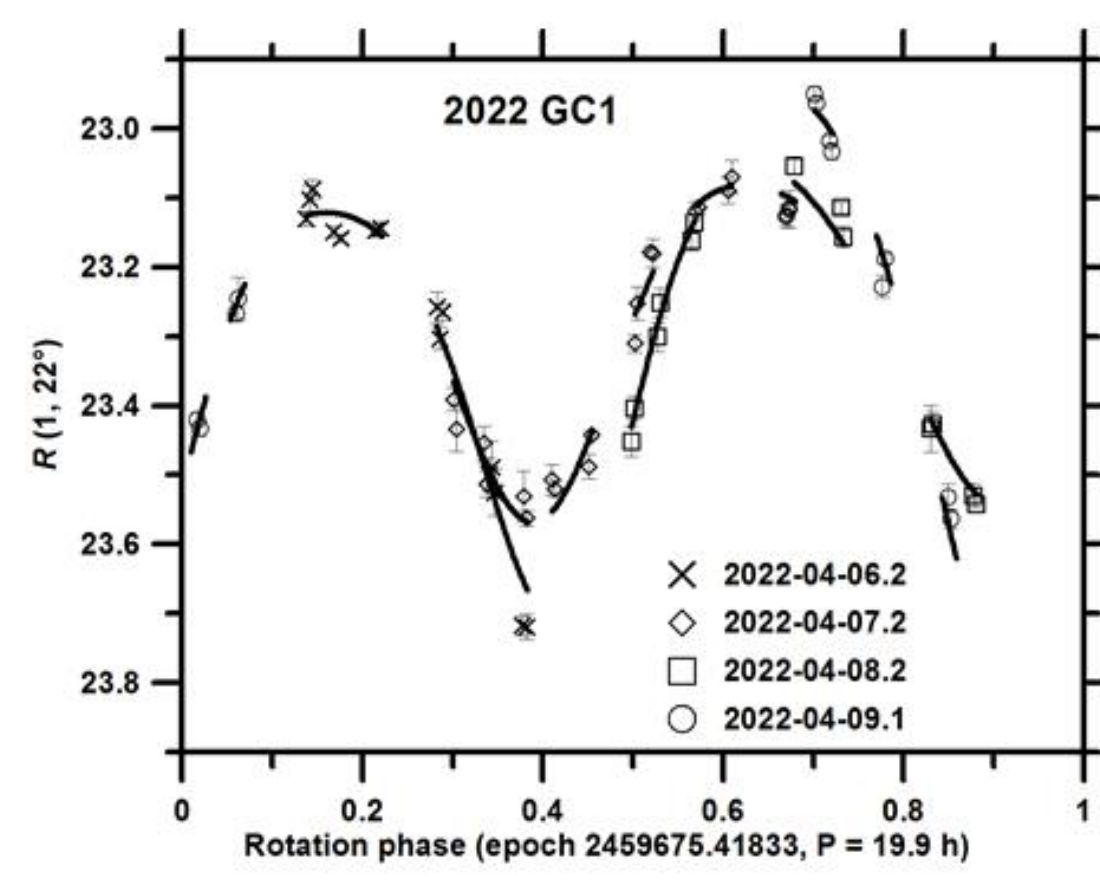
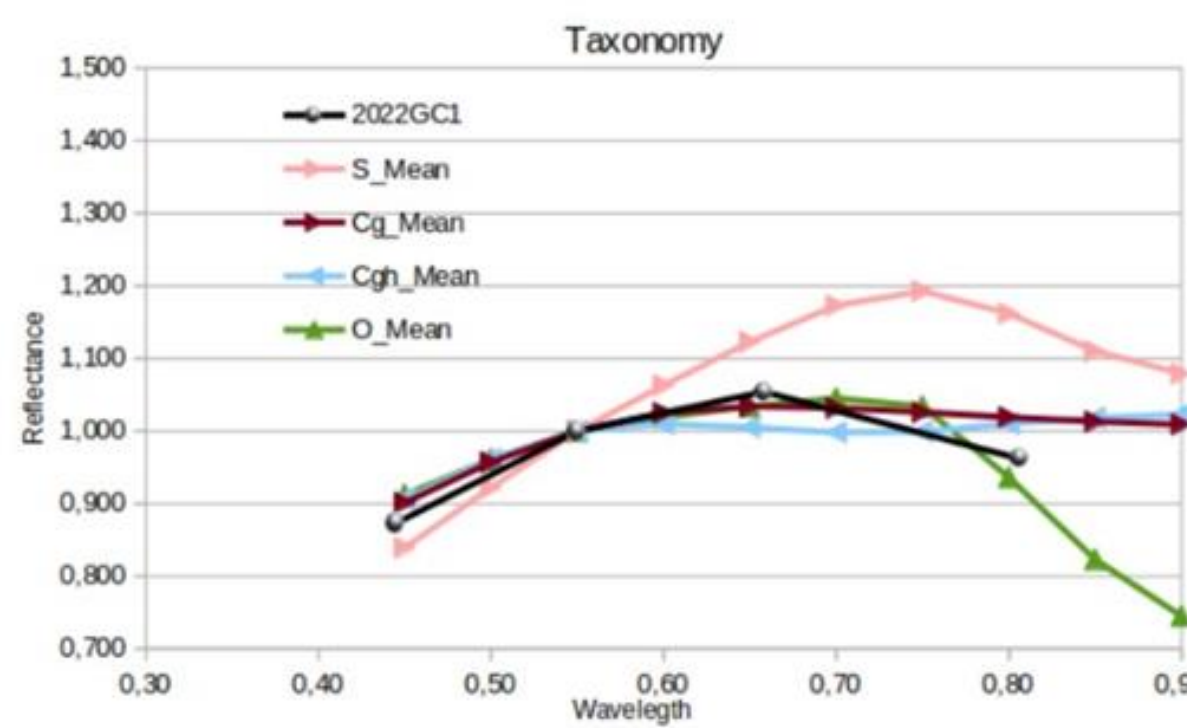
- WP3** – carry out physical characterization upon short notice through the project observational network
- WP4** – implement a basic **rapid response system** scenario based on existing robotic telescopes through developing the related procedures and tasking SW
- WP6** – analyze outcome and issue recommendations: *Final Report on international cooperation for NEO physical characterization and rapid response systems (D6.4)*

Rapid Response: present scenario



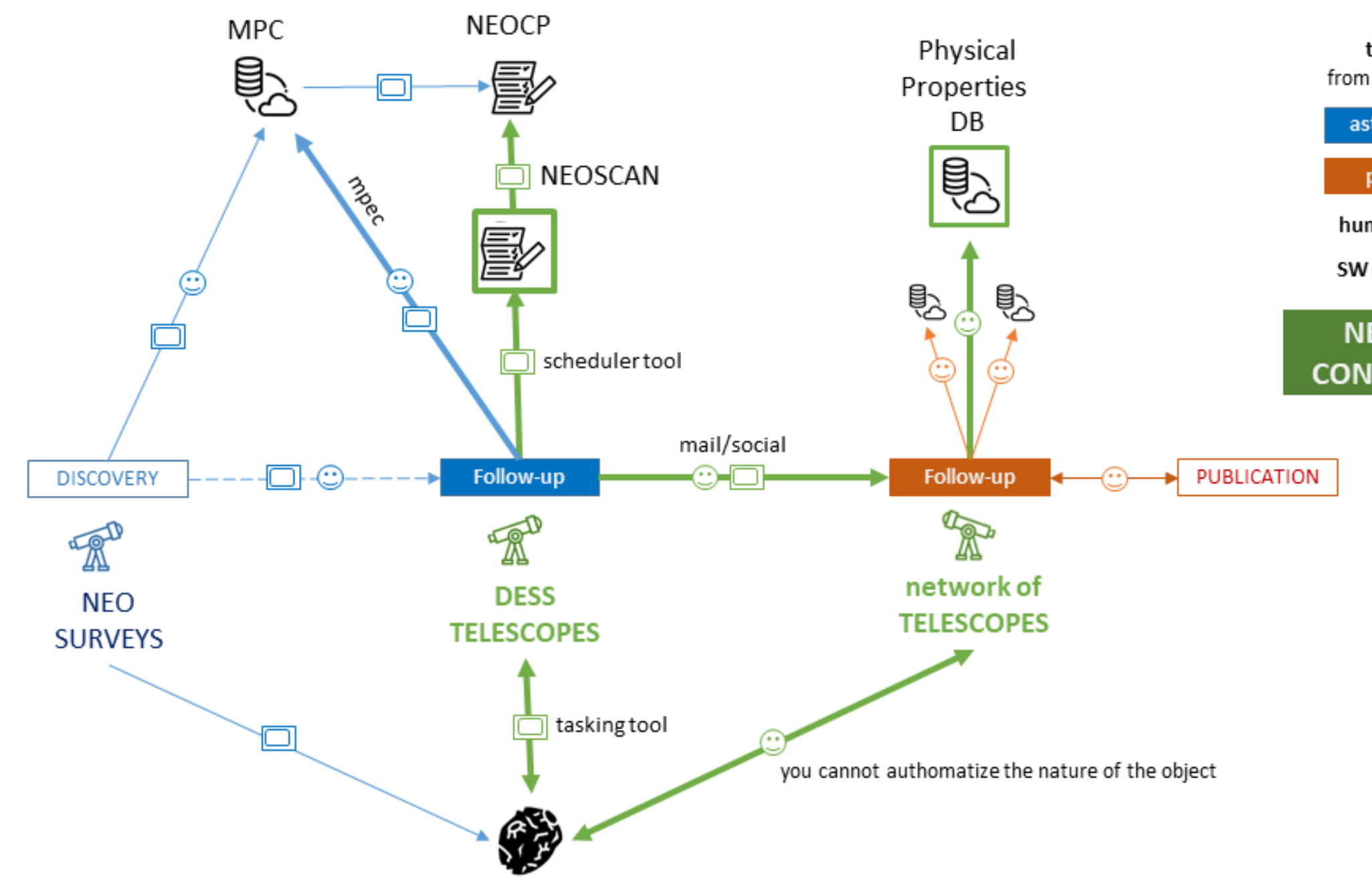
Example: 2022 GC1

Alert: 3 apr 2022
TNG colours: 5 apr 2022
DK154 lightcurve: 6-9 apr 2022



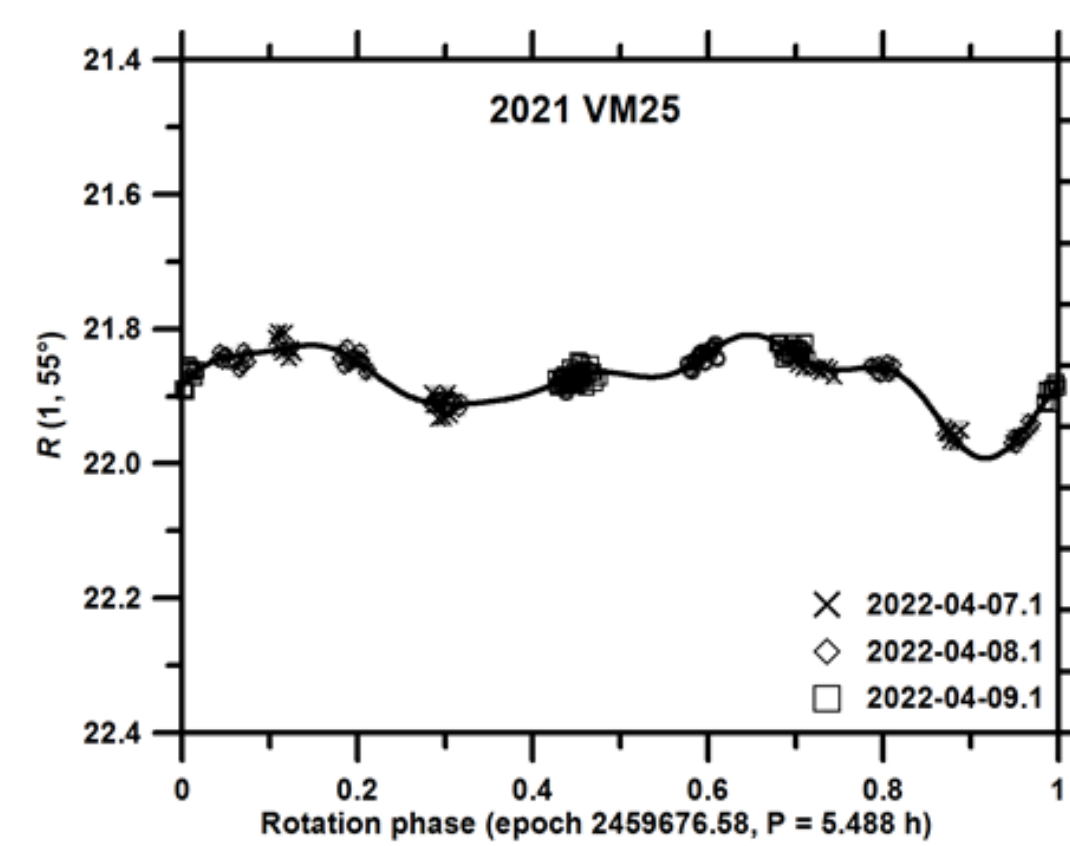
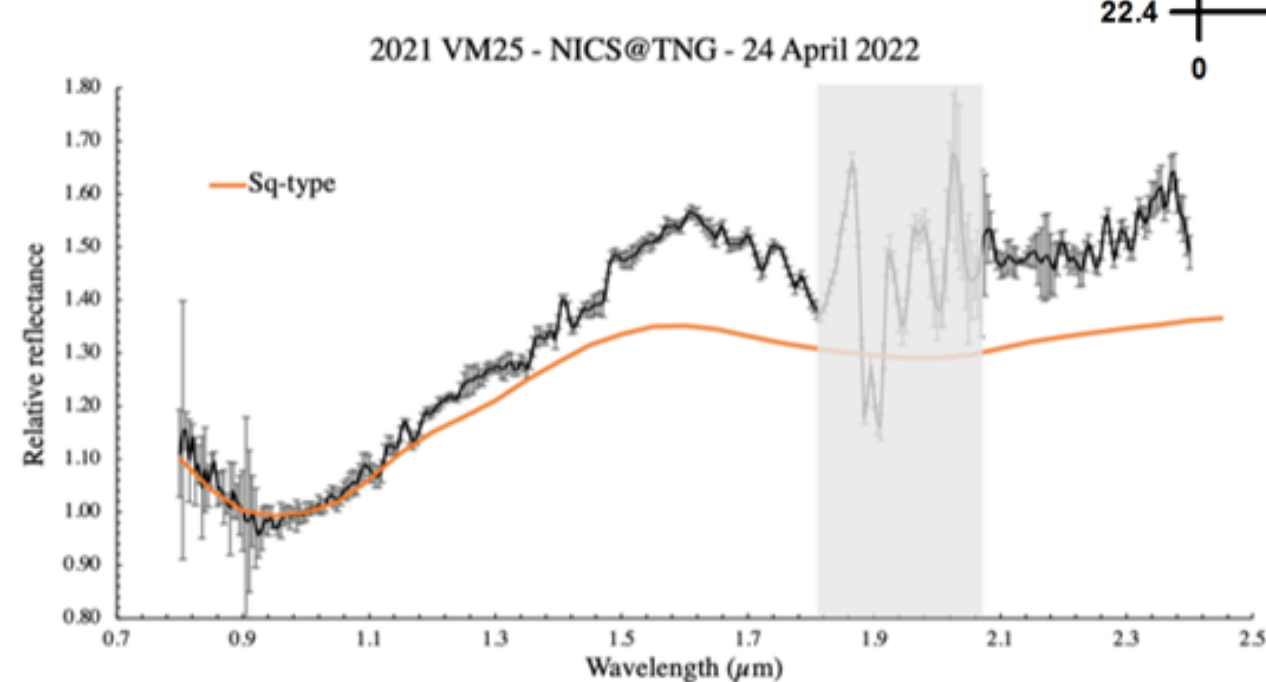
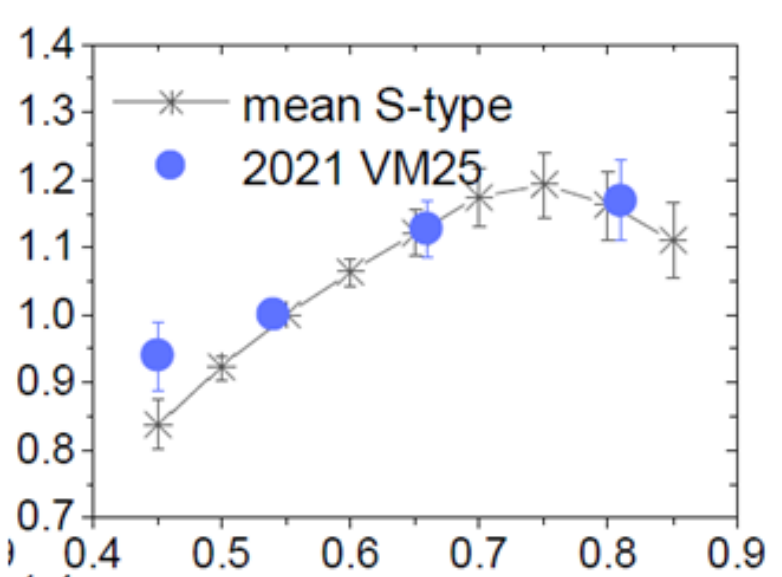
Slow rotator in a non-principal axis (tumbling) spin state
Main period 19.9 ± 0.1 h
Second period: 14.8 ± 0.1 h
Axis ratio $a/c \geq 1.5$

Rapid Response: proof of concept



Example: 2021 VM25

Alert: 4 apr 2022
OHP spectrum: 8 apr 2022
TNG spectrum: 23 apr 2022
DK154 lightcurve: 7-9 apr 2022



Rapid Response: lessons learned

- ✓ **Rapid response lead time**
 - days
 - fulfills imminent impactor civil protection requirements
- ✓ **Imminent impactors target selection**
 - critical for system performance
 - essential for near-future NEO survey scenario
- ✓ **Astrometric follow-up tasking**
 - tasking formats to be agreed
 - larger aperture telescopes needed
- ✓ **Physical follow-up tasking**
 - cannot be fully automatized
 - improved with the use of e.g. social media
 - secure social media needed
 - priority access to large telescopes needed
 - Institutional empowerment needed (IAU? UNOOSA?)
- ✓ **System shall be ready to include space assets**

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