

# Algorithms Working Group

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# Draft findings and recommendations:

1. We re-emphasize SATCON1 recommendations 1 to 3

New tools are critical to *partially* mitigate impacts on astronomy:

- **Will my observation be affected?** *PassPredict*
- *PassPredict* and simulation software will also enable quantification of the predicted degradation of science data in a particular situation
- **Can I salvage useful science from affected data?** *TrailFix*
- Astronomers also need a large **simulation and modeling effort** to assess impacts of current and future constellations on both ground-based and space-based observations

2. The working group has carried out a study of the **algorithms and interfaces needed** for these software tasks; this will be included in the report .

# Draft findings and recommendations:

3. **Some software already exists** to help with parts of these tasks. Much is specialized to particular instruments, **needing to be generalized.**
4. There are gaps where software does not exist and we will need a significant software development effort. Project management, documentation, user support, and maintenance are needed, requiring **substantial resources and funding.** Educational materials (e.g., lesson plans) are also desirable.
5. To support the diverse community of night sky users, **software must be provided in several forms:** libraries (integrated with core astronomy interfaces like *AstroPy*), applications for data pipelines, and web services.

# Draft findings and recommendations:

6. It is urgent to develop a set of example datasets covering a wide range of instrument and satellite-trail properties which can serve as a **standard test suite** for the development of the software and as benchmark comparisons for archival and new sources of data.
7. We endorse the **SatHub concept** developed by the Observations WG. SatHub can provide a natural home for curated software, satellite catalogs and ephemeris access, and test data including their documentation and distribution. This will need continuing professional development, support and maintenance.
8. Constellations are being launched now, but software takes time to develop. **Resources should be made available as soon as possible.**

# Draft findings and recommendations:

9. If the satellite constellations are deployed as planned, we find that **no software solution** can fully mitigate the impact on astronomical observations and on spectroscopic observations in particular. It is likely that the community will be **forced to make a massive investment in hardware** such as auxiliary spotting cameras or other solutions at all ground-based observatories.