3.1 Publishable summary

3.1.1 Project context and objectives

Solar System Science has traditionally been undertaken within a number of separate disciplines. However, like any system its aspects are inter-related and it has been difficult to address these aspects because of the lack of the integrating technology required to span the inter-disciplinary boundaries. While advances in technology means that the intrinsic differences between disciplines (manifest in differing data formats and dependencies) are beginning to be addressed, it is necessary to coordinate our efforts in order to help break down the barriers.

The European Commission is currently funding three projects under FP7 that are related to science within the Solar System:

- The Heliophysics Integrated Observatory, HELIO (funded under FP7-INFRA-2008-2; *http://www.helio-vo.eu/*)
- The Europlanet Research Infrastructure, Europlanet RI (funded under FP7-INFRA-2008-1; *http://www.europlanet-ri.eu/*)
- The Solar Terrestrial Investigations and Archives, SOTERIA (funded under FP7-SPACE-2007-1; *http://soteria-space.eu/*)

The three projects explore different aspects of Solar System science that are overlapping, but currently any interoperability between them is fortuitous rather than planned. Each project has provided a degree on integration in its own area of interest and, since they inevitably have a number of datasets in common, there is a desire amongst them to increase their effectiveness through the sharing of resources. At the data and metadata level there are therefore clear needs to improve interoperability by establishing standards that will help define how services and data should be managed.

The objectives of CASSIS are aimed at increasing the ability of the scientific community within Europe to undertake research on all aspects of science related to the Solar System. Europe has a wealth of talent in most of the disciplines involved in solar system science with many scientists being the leaders in their fields. The coordination provided by CASSIS will allow them to address problems that are cross-disciplinary with increased ease and thus strengthen the European Research Area in the global arena.

There are four basic objectives:

1 Establish guidelines to improve the access and interoperability of the data that are serviced through the infrastructures of HELIO, Europlanet RI and SOTERIA, for the communities involved in these projects and for other related communities.

2 Investigate ways to make key types of metadata and derived products more complete and coherent and thus more usable across the domain boundaries.

3 Establish a forum within Europe to discuss and coordinate science within the solar system that can represent the needs of this general community to the European Commission, ESA, funding agencies at national level and other decision making organizations.

4 Coordinate a range of dissemination activities to produce material that encompasses aspects of science throughout the solar system

CASSIS will try to break down/bridge the remaining boundaries between the domains, and as these are reduced, researchers will be provided with a greater ability to combine datasets in ways that they had not previously considered. If done correctly, this will also extend their ability to work with other related virtual observatory initiatives funded within Europe and elsewhere.

CASSIS will also try to establish a framework at an international level for discussions on standards related to solar system science. Up to now, one of the problems has been that the communities involved have been very inhomogeneous and bodies like the IVOA have not known how to accommodate their diverse needs. By coordinating these needs, CASSIS will have increased ability to influence standards set by the IVOA and similar bodies like the IPDA.

The level of coordination of activities related to the solar system proposed by CASSIS is not present in other parts of the world and this initiative should greatly increase Europe's effectiveness at the international level. If managed correctly, the project could be perceived as a pool of expertise that could help influence policy in European solar system science.

3.1.2 Work since beginning of the project and the main results so far

During the first reporting period we made a start on most areas. The project Web pages were established and provide information about the project. We also gathered information about available resources that is being collated into reports; these are the basis on which standards are developed.

In the second year we developed a Web Portal that is focused on outreach and turned our interaction with the three projects involved in CASSIS, and other interested parties, into a set of deliverables related to standards and interoperability.

In both the years we made presentations that included CASSIS, either as the main topic or in conjunction with one of the projects, at conferences, including COSPAR, EPSC, ESWW, AGU, EGU and the UK NAM. One of the presentations that focused on CASSIS was at the FP7 Space Conference "Let's Embrace Space" where ideas from the Capacities side of FP7 were introduced to the Space side. Since some of the capabilities being developed under the Capacities programme are now quite advanced and highly relevant to a number of disciplines, there is a lot to be gained by deploying these in other parts of FP7.

We have also started talking with a number of groups that are representative of communities, including CESRA (solar radio) and EAST (solar optical); we have also had discussions with interested parties at several of the meetings that presentations were made at. During the second year we have become involved in more a detailed interaction with ESA/ESAC about using the ideas of CASSIS to help the Solar Orbiter mission develop it data management plans.

We are now making good progress in finding ways to improve the interoperability of data and e-infrastructures used to support science research in the Solar System.

3.1.3 Expected final result and potential impacts

CASSIS will coordinate activities related to data access and data management within Solar System science and work with the communities to define the required infrastructure in order to help break down the barriers.

The coordination produces a potent force for discussing and setting standards at the international level and it opens up a pathway for cooperation with disciplines outside of those involved in CASSIS, including geo-sciences and astrophysics. The introduction of good practices in using and describing data that the work packages will bring about will not only facilitate access with the projects and by other projects, but should provide a good template for future projects and both enhance access and reduce costs.

3.1.4 More Information

More information is available on the project Web site – www.cassis-vo.eu