



ACI:

The UK Astrodynamics Community of Interest

Simon George – Dstl SSA Project
sgeorge1@dstl.gov.uk



Ministry
of Defence

08/09/2021 / © Crown copyright 2021 Dstl

UK OFFICIAL

- **Initial workshop** held at the *International Space Innovation Centre* (Harwell) in **February 2013**
 - Organised by **Dstl / UKSA** to present emerging UK interests relating to SSA
 - **27** Participants; representatives from:
 - Gov't: Dstl, UKSA, STFC, NERC
 - 7 UK universities, 1 UK company, ISIC/Catapult

→ **Astrodynamics Community of Interest** formed to unite and expand this community



■ UK Astrodynamics Community of Interest

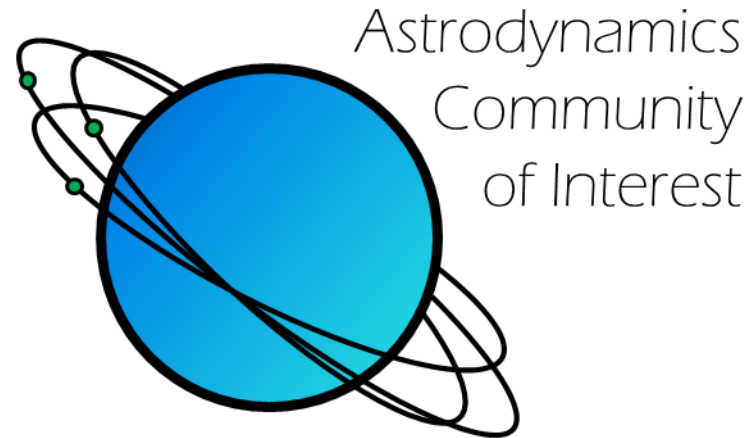
EST. October 2015

“Government”-led (Dstl/UKSA/MOD) initiative to bring together disparate UK SSA and astrodynamics community

– A “*Coalition of the Willing*” for:

- Academics
- Researchers
- Practitioners
- Industry Experts

in space surveillance, tracking and astrodynamics



Provide central forum for government to engage with UK suppliers and discuss SSA

Provide opportunities for community networking and discussion

Present UK Gov't interests and strategic direction to UK supplier base

Identify areas of SSA expertise in UK academia and research

Bring UK SSA expertise together for collaboration and knowledge transfer

Present and identify funding initiatives to support the community

Help to shape research and UK Gov't contracts placed to academia/industry

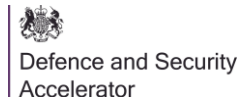
Build UK SSA "ecosystem" and supplier base

Discuss open research challenges and identify potential solutions

Participants



Beechleaf Consulting



UK OFFICIAL

■ Workshops & Engagement

- Paradigm of **themed workshops** that drive specific technology developments
 - Historically, delivered / maintained via **face-to-face** workshops (6-12 month cadence) on a particular challenge/topic
 - *Moved to “virtual” since the beginning of this pesky pandemic...*

■ Updates

- Community maintained via **mailing list** and periodic updates
- Contact ssa@dstl.gov.uk for addition to this list

■ Experiments and Demonstrations

- Utilised as a vehicle for **UK SSA experiments** → (e.g. *PHANTOM ECHOES*)
 - Enable sandbox for demonstrating UK capability and raising TRL of candidate technologies / techniques

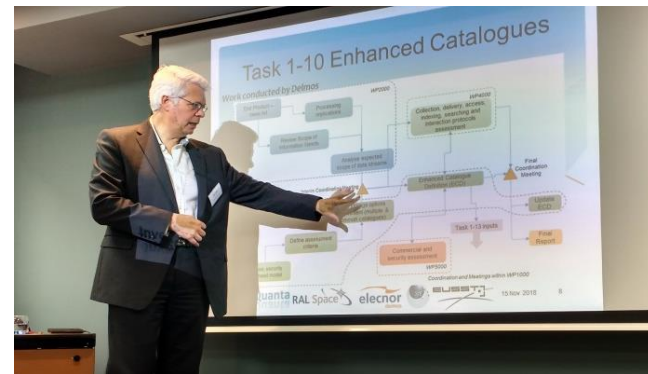
Face-to-Face ACI Workshops (2013-2019)



- “Astrodynamics Research in the UK” workshop **Feb 2013**
- ATV-5 experiment workshop **Jun 2014**
- ATV-5 experiment workshop **Oct 2014**
- Astrodynamics Community of Interest workshop **Oct 2015**
- Astrodynamics Community of Interest workshop **Apr 2016**
- ACI Workshop – *Novel RF Techniques for SSA* **May 2016**
- ACI Workshop – *Daedalus Challenge* **Nov 2016**
- ACI-EOARD “*Expanding the Observational Database for GEO*” #1 **Dec 2016**
- ACI-EOARD “*Expanding the Observational Database for GEO*” #2 **Jun 2017**
- ACI Workshop – *The Daedalus Experiment* **Nov 2017**
- ACI-EOARD “*Confident Attribution of Space Object Status*” **Mar 2018**
- ACI Workshop – *Way Forward for a UK Space Catalogue* **Nov 2018**
- ACI Workshop – *Developing UK SSA Capability* **Jun 2019**

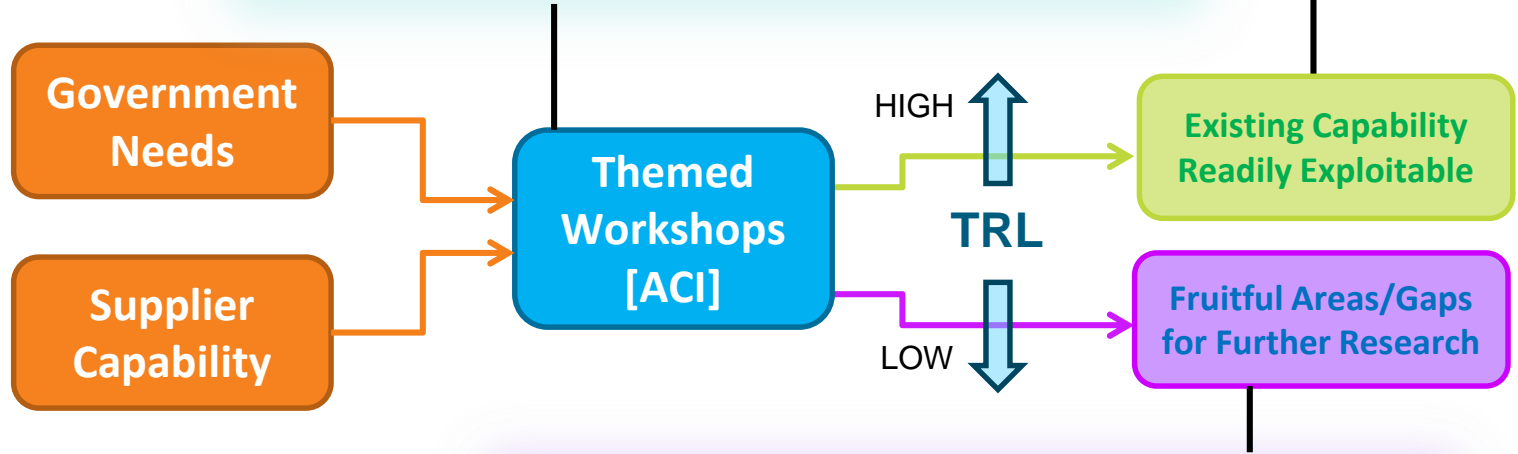
Face-to-Face ACI Workshops (2013-2019)

How things used to be...



Themed Workshops

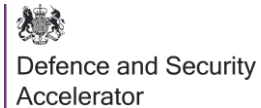
- Present research challenges / opportunities from Gov't
- Analyse and explore these with ACI community
 - Who fits in where?
 - Refine problem statements to match capability



Advise OGDs on Candidate Capabilities:



Funding Routes:



- Refined descriptions of work to put out to contract
- Opportunities for mutual benefit through coordination (e.g. data sharing)

Previous Examples of Community Engagement

- **Virtual ACI Workshop:**
RF Technology for SDA
- Three-day virtual workshop
(February 2021):
 - Identify UK RF expertise able to contribute to forthcoming RF SDA technology demonstrator projects
 - Set realistic aspirations of what may comprise a UK capability



The screenshot shows the GOV.UK website interface. At the top, there is a search bar and navigation links for 'Departments', 'Worldwide', 'How government works', and 'Get involved'. Below this, a breadcrumb trail reads 'Home > Military equipment, logistics and technology'. The main heading is 'Notice' followed by 'Competition: Space to Innovate Campaign - Alpha Drop'. The text below states: 'This Defence and Security Accelerator (DASA) campaign seeks proposals for novel and innovative future space technologies.' It also includes source information: 'From: Defence and Security Accelerator, Ministry of Defence, and Defence Science and Technology Laboratory', published on 16 June 2021, and last updated on 28 July 2021. At the bottom, there are sections for 'Documents' and 'Related content', with a document titled 'Space to Innovate Campaign - Alpha Drop' and a related content item 'Competition: space to innov'.

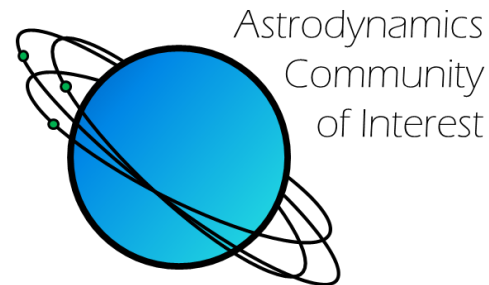
- **Space to Innovate *Alpha*:**
Defence and Security Accelerator
- Funding for SSA-related projects:
 - **Challenge 2:** Novel methods for characterising objects in space and their intent
 - Assessment currently underway
- *Bravo* expected later this year

Ambition: Establish ongoing mechanism to support development of UK supplier base across SSA

- Continue current paradigm of **themed workshops** that drive specific technology developments
- Explore future opportunities to **demonstrate community capabilities**
 - Shared/collaborative software frameworks, e.g. Stone Soup, VerSSA
 - Provision of sensor facilities (e.g. Dstl EO system) and real-world data
- Maintain tempo & **engagement** between events

*By 2025, have contributed to an **ecosystem for UK SDA** promoting growth of a **world-class capability** aligned to MOD (and wider UK) needs that also contribute to global SDA initiatives*

- Great success of ACI community in shaping UK SSA research
- Keen to support the work of GNOSIS
 - Help define problems; provide data from experiments
 - Identify use cases / exploitation routes
 - Support to academia e.g. iCASE awards
- Opportunity to help shape future UK plans



Simon George (Dstl)

sgeorge1@dstl.gov.uk

To Get Involved:
ssa@dstl.gov.uk

[dstl] The Science Inside

Discover more



UK OFFICIAL