# CONNECTION/COMMUNICATION

*How best to find research that is ready for applications, and how to find applications where research may be useful.*

Barriers for one who wishes to apply their research:

1) Finding and knowing best how to communicate with end users

2) Knowing what research will produce useful tools to aid in decision making processes

3) Knowing the requirements and needs of the user community

4) Advertising how our research could be useful

# CONNECTION/COMMUNICATION

*There is a need in our community for more efficient pathways towards applications.*

Heliophysics and the applied Space Weather communities are not as mature as the Earth Science Applied Science program.

Space Weather/Heliophysics end users are often other researchers, DoD, and other government agencies along with industry partners.

Not all of the end users are able to talk directly to researchers or to share their data.

Our community needs to develop more efficient pathways of communication with our end user communities.

A. J. Halford, **A. C. Kellerman**, K. Garcia-Sage, J. Klenzing, B. A. Carter, R. M. McGranaghan, T. Guild, C. Cid, C. J. Henney, N. Yu. Ganushkina, A. G. Burrell, M. Terkildsen, B. J. Thompson, A. Pulkkinen, J. P. McCollough, S. A. Murray, K. D. Leka, S. F. Fung, S. Bingham, B. M. Walsh, M. W. Liemohn, M. M. Bisi, S. K. Morley, D. T. Welling

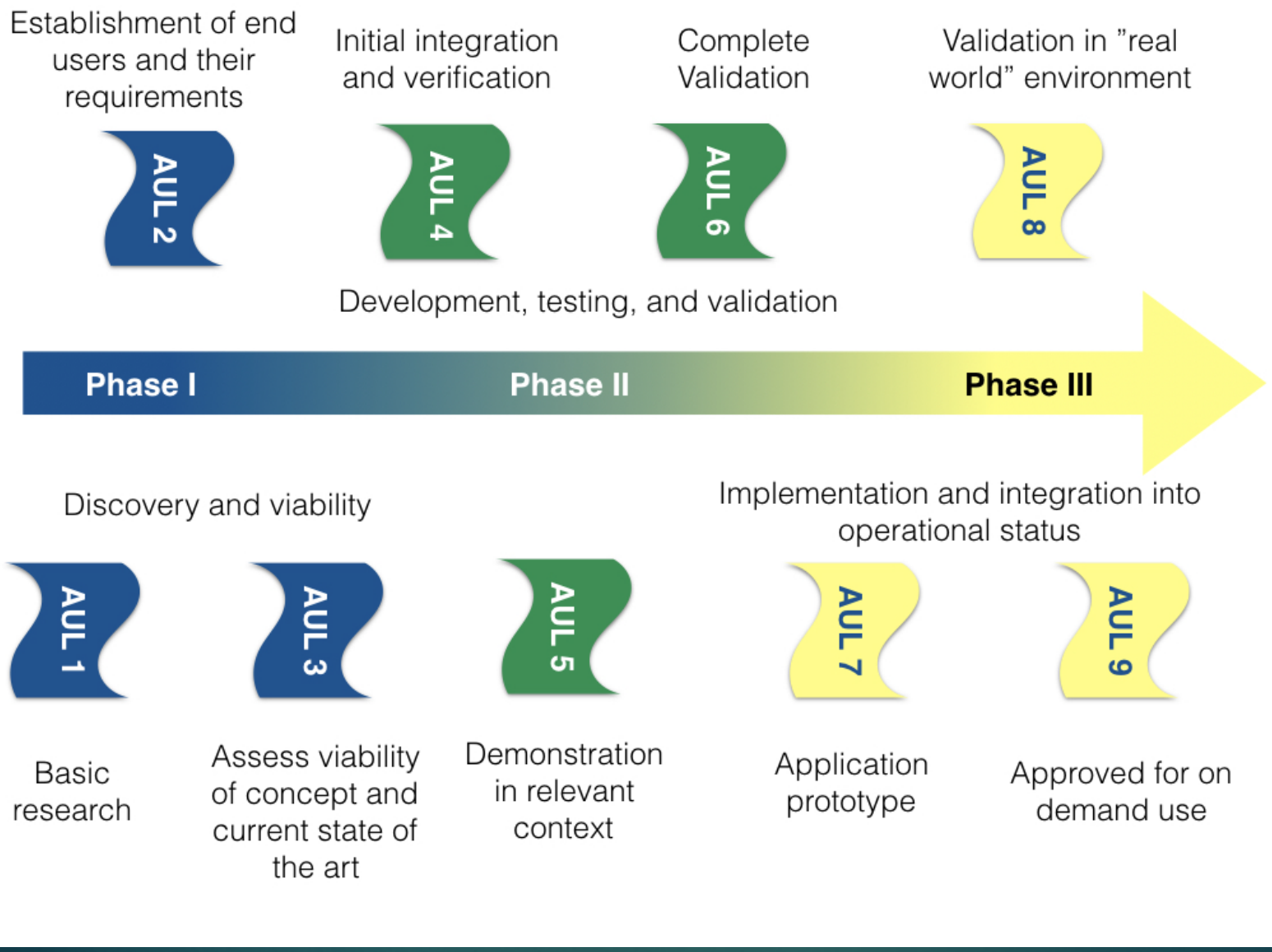
# APPLICATION USABILITY LEVELS

*A framework and scale for aiding and tracking the progress of a particular project towards a specific application*

Application: A specific use for a project, such as a data product from a mission, a forecast of a specific quantity from a numerical model, and/or software developed for a particular use. Each application has its own unique requirements and metrics for validation.

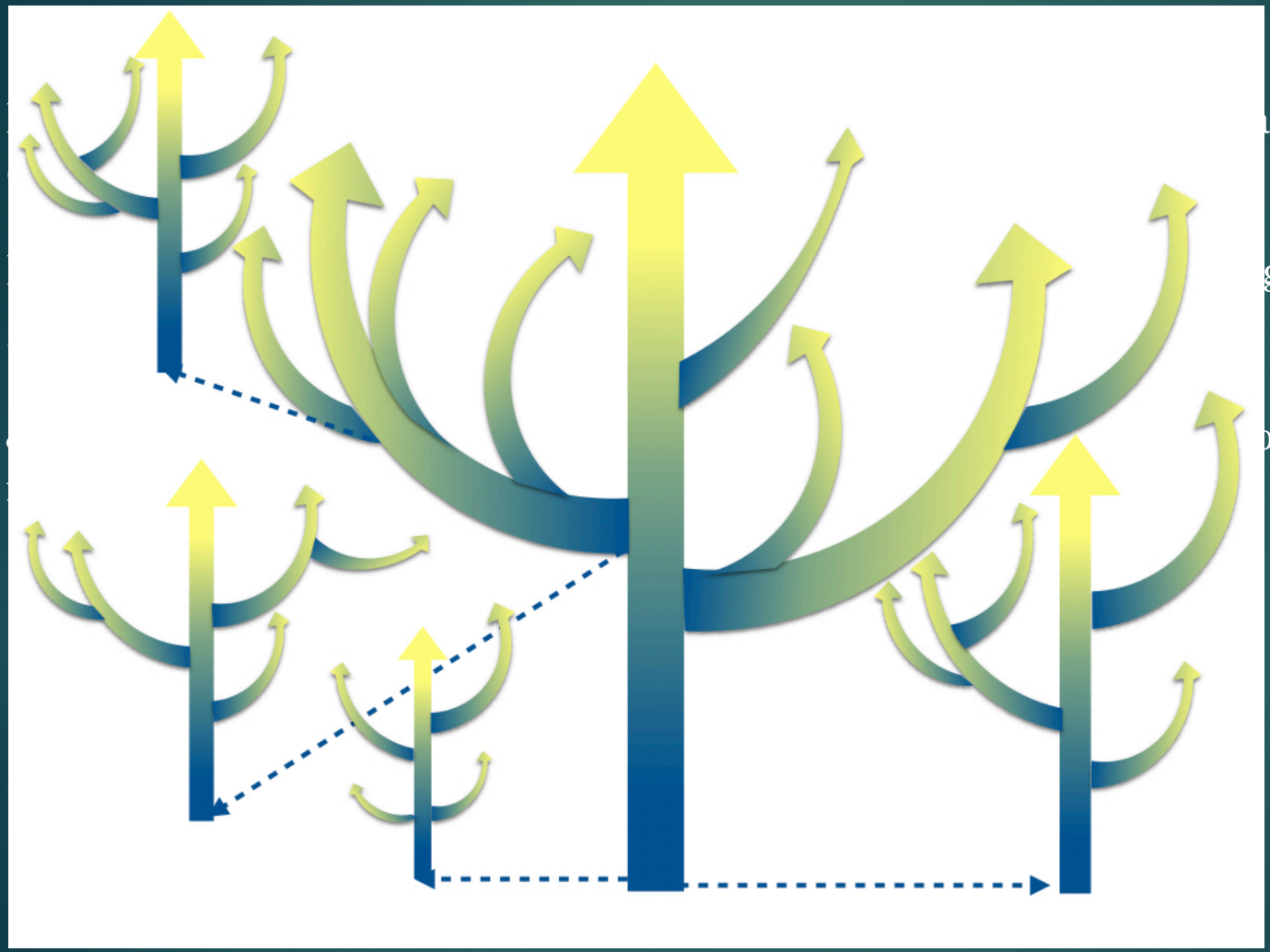
Project: An initiative that is in progress towards a particular application.

# APPLICATION USABILITY LEVELS



# BEYOND AUL 9

*AUL 9 is not the end…*



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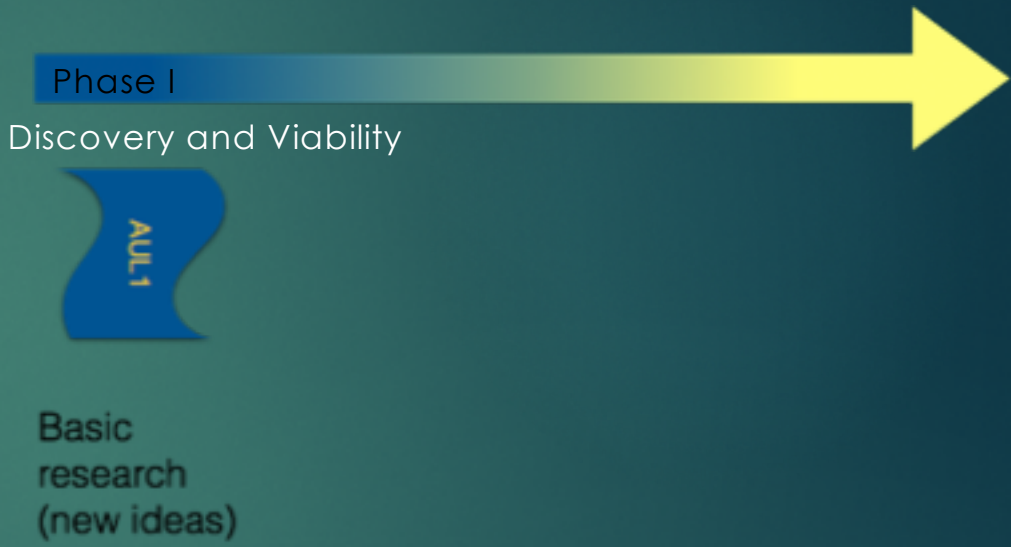
## *Application Usability Levels*

*Examples*

### AUL1: Project

Jeff has a new cubesat mission and believes that the observations will be useful to modelers. They have just written their instrument paper and have started to consider the types of data products which will be useful as an input for modelers.




**Milestones:**

- ✓ AUL1 - Ideas for how project output may enhance decision making or be applied to an end user application.
- ✓ AUL1 - Research is documented and disseminated for the project, so that the usability may be assessed by way of the AUL method.
- ✓ AUL1 - Potential interested end users are identified, but not necessarily contacted.

## *Application Usability Levels*

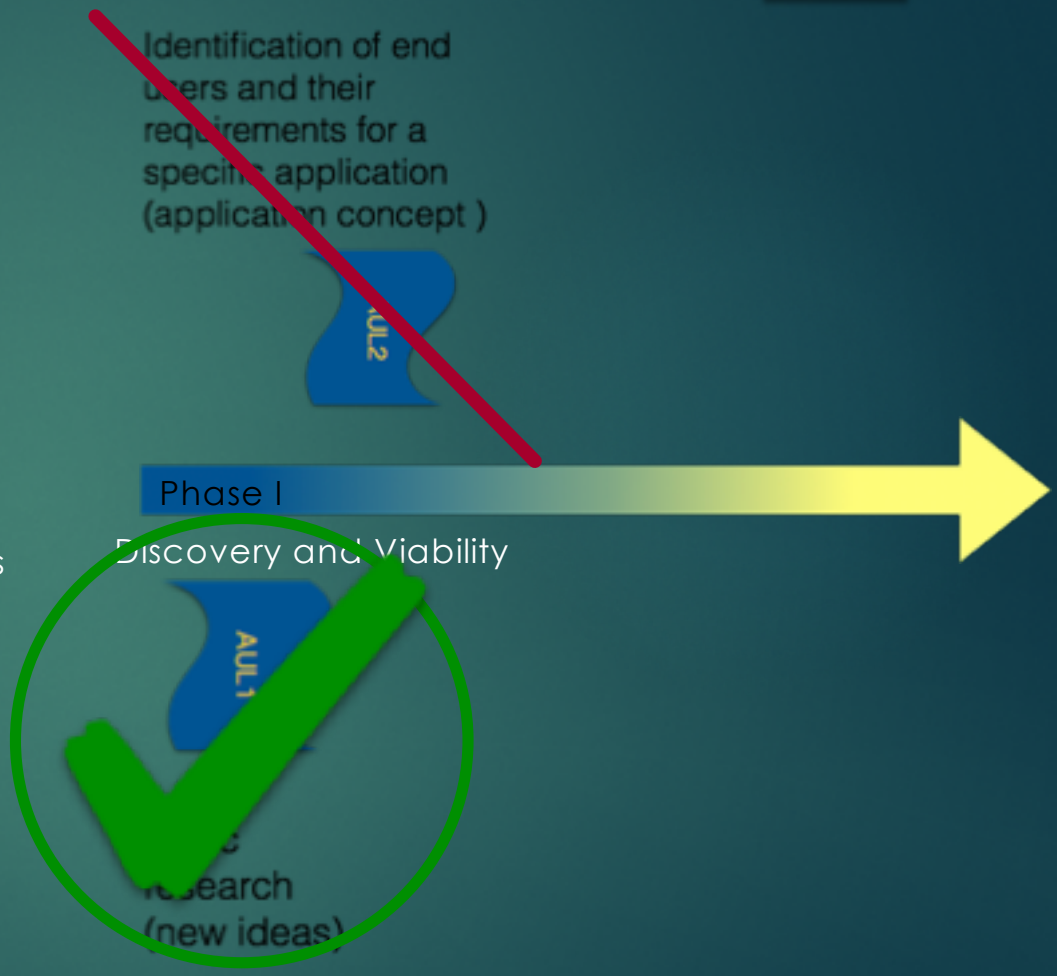
*Examples*

### AUL1: Project

Jeff has a new cubesat mission and believes that the observations will be useful to modelers. They have just written their instrument paper and have started to consider the types of data products which will be useful as an input for modelers.

**Milestones:**

- ✓ AUL2 - Formalization of the application.
- ✓ AUL2 - An end user is contacted and avenues of communication are established.
- AUL2 - Identification and formalization of the requirements and metrics necessary for successful application of the project for the end user's needs.

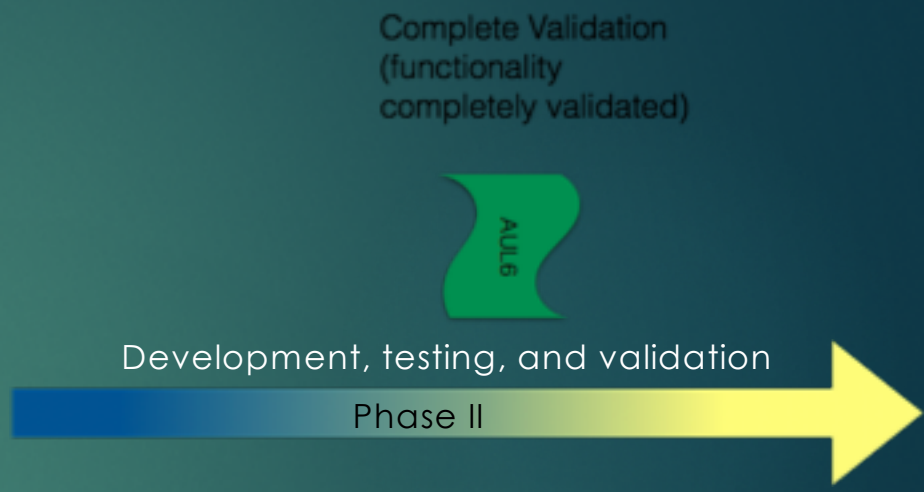


## *Application Usability Levels*

*Examples*

### AUL6: Project

Brett has a new real-time forecasting model of plasma bubbles for the Australian Bureau of Meteorology. Together they have determined specific metrics and requirements. The new model has been validated and is working in the relevant environment – in a simulated operational environment at RMIT - and shown to be better than the current state of the art. The results were just published in Space Weather.




**Milestones:**

- ✓ AUL6 - Prototype application system beta-tested in a simulated operational environment.
- ✓ AUL6 - Projected improvements in performance of the state-of-the-art and/or decision making activity demonstrated in simulated operational environment.
- ✓ AUL6 - Publication of the specific application and associated metrics and the projects progress towards this application.

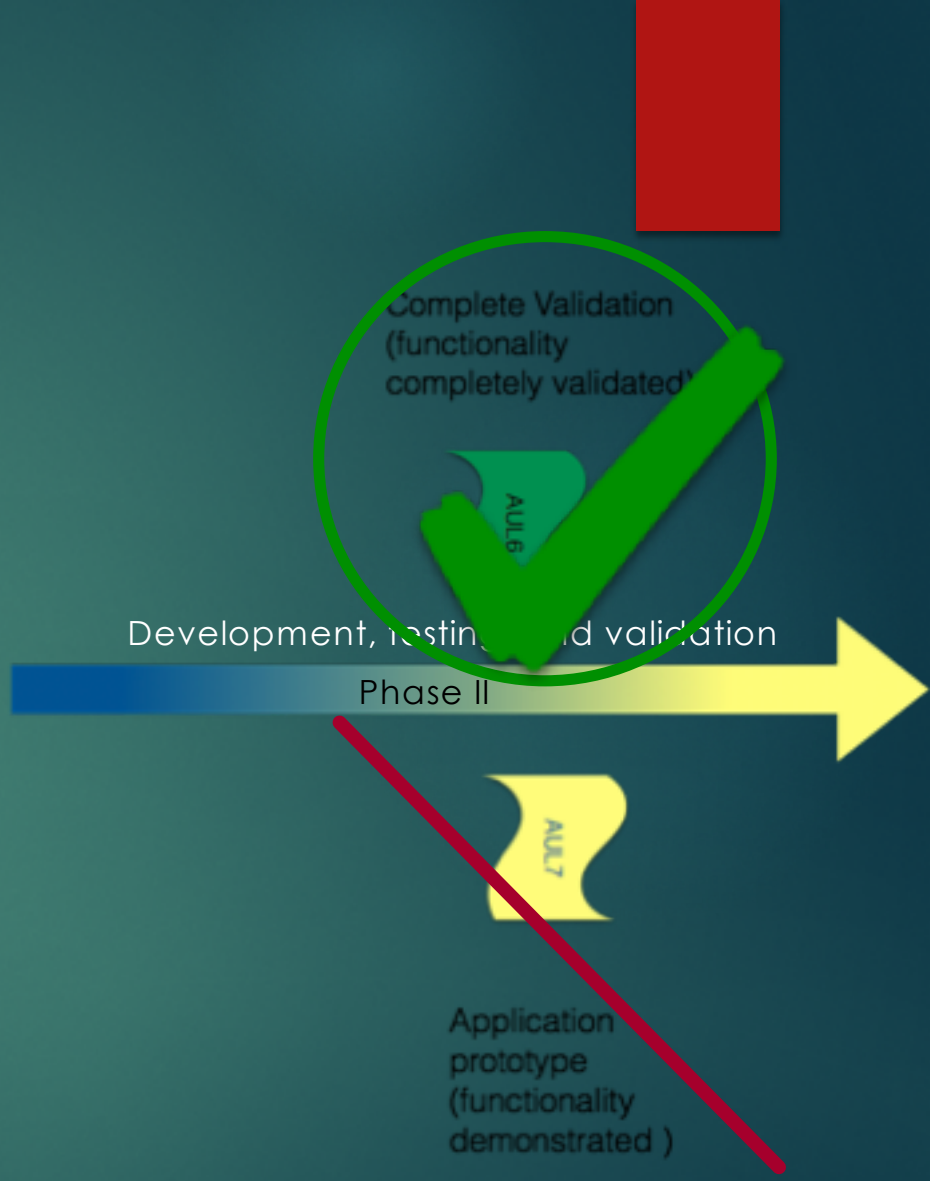
## *Application Usability Levels*

*Examples*

### AUL6: Project

Brett has a new real-time forecasting model of plasma bubbles for the Australian Bureau of Meteorology. Together they have determined specific metrics and requirements. The new model has been validated and is working in the relevant environment – in a simulated operational environment at RMIT - and shown to be better than the current state of the art. The results were just published in Space Weather.

**Milestones:**

- AUL7 - The system must be fully integrated into the operational environment specified by the end user.
- AUL7 - The system's functionality is tested and demonstrated in the end user's specified relevant environment.

✓ AUL7 - Project team must demonstrate the functionality of the new system for the end user's application and disseminate the results.