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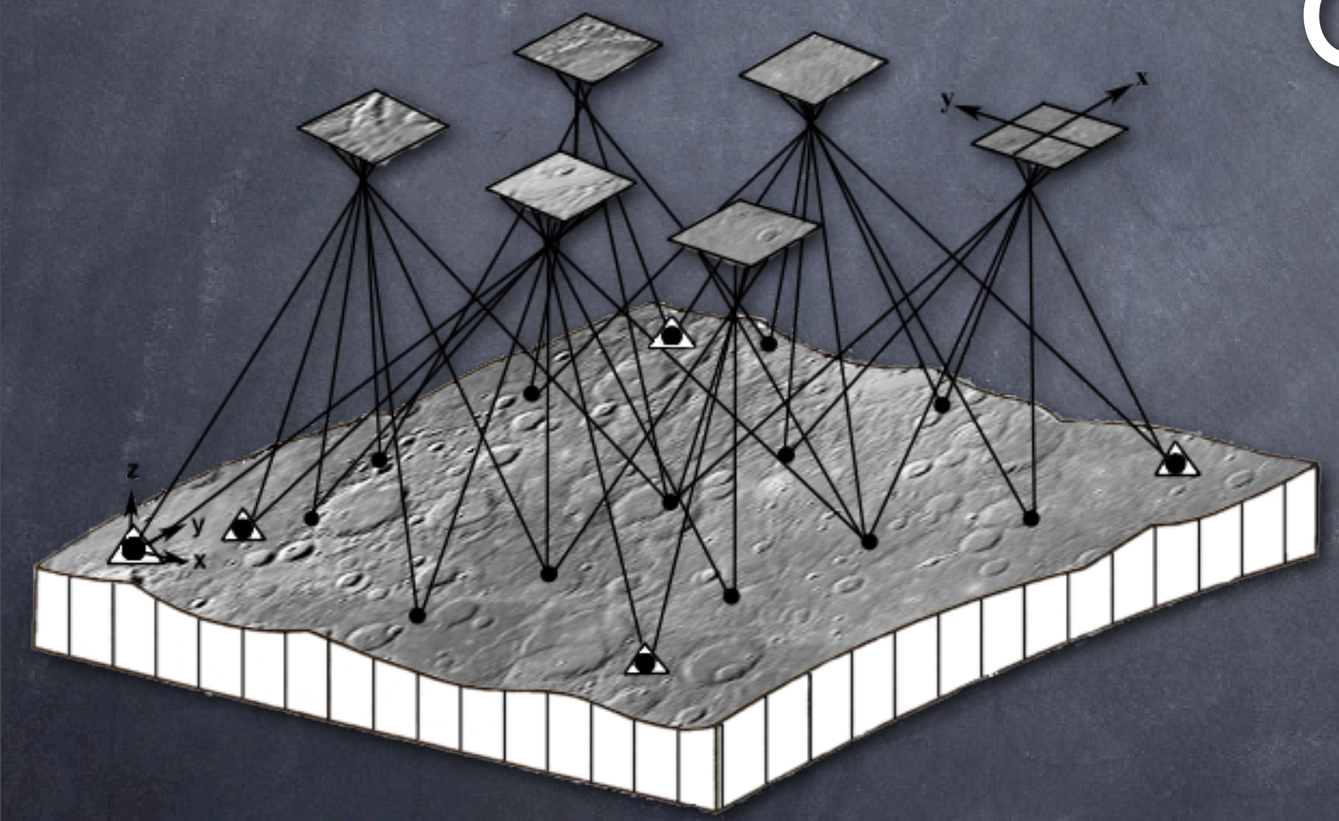
ASTROGEOLOGY SCIENCE CENTER

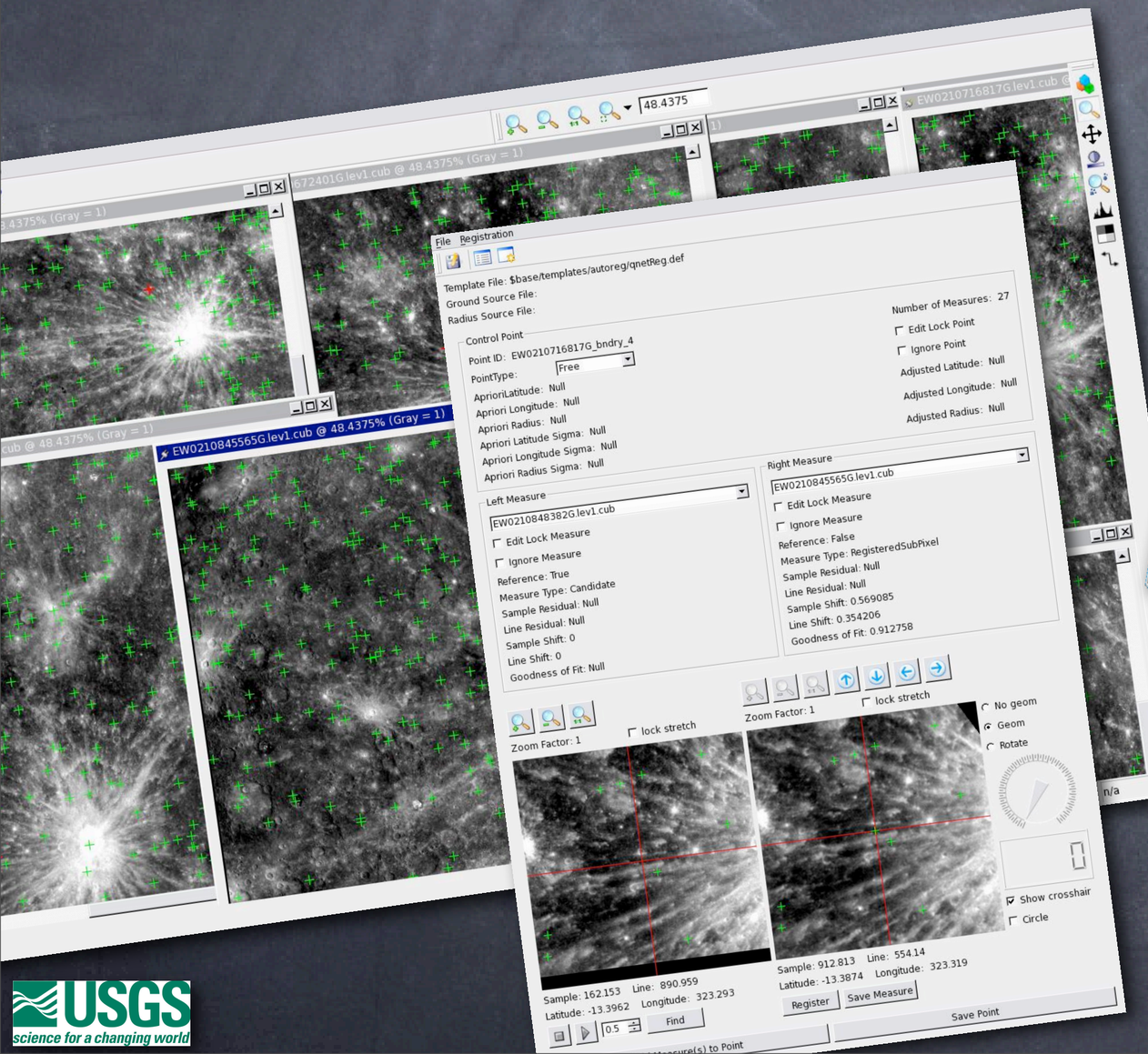


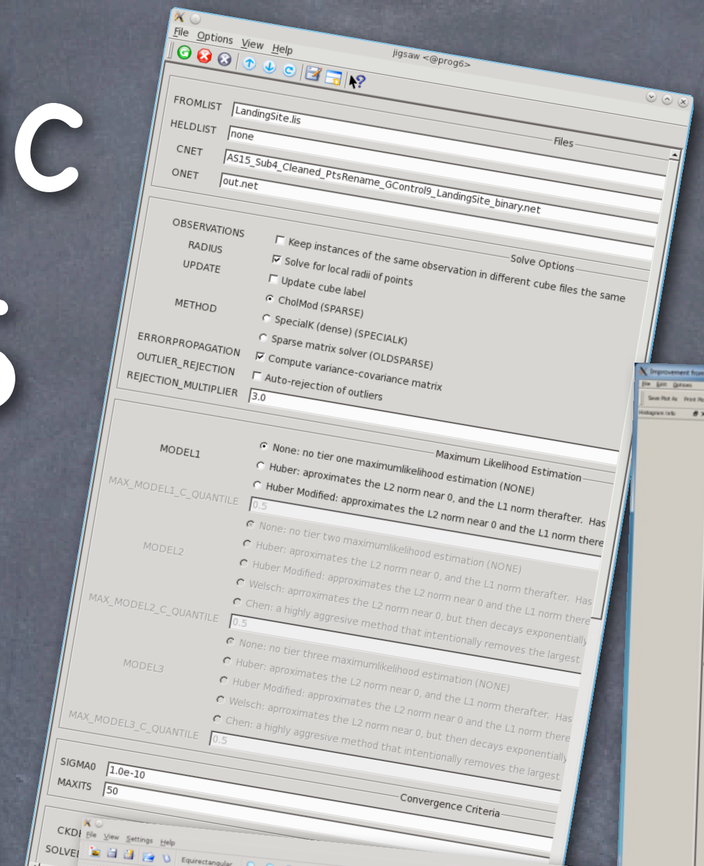
Photogrammetric Control in ISIS

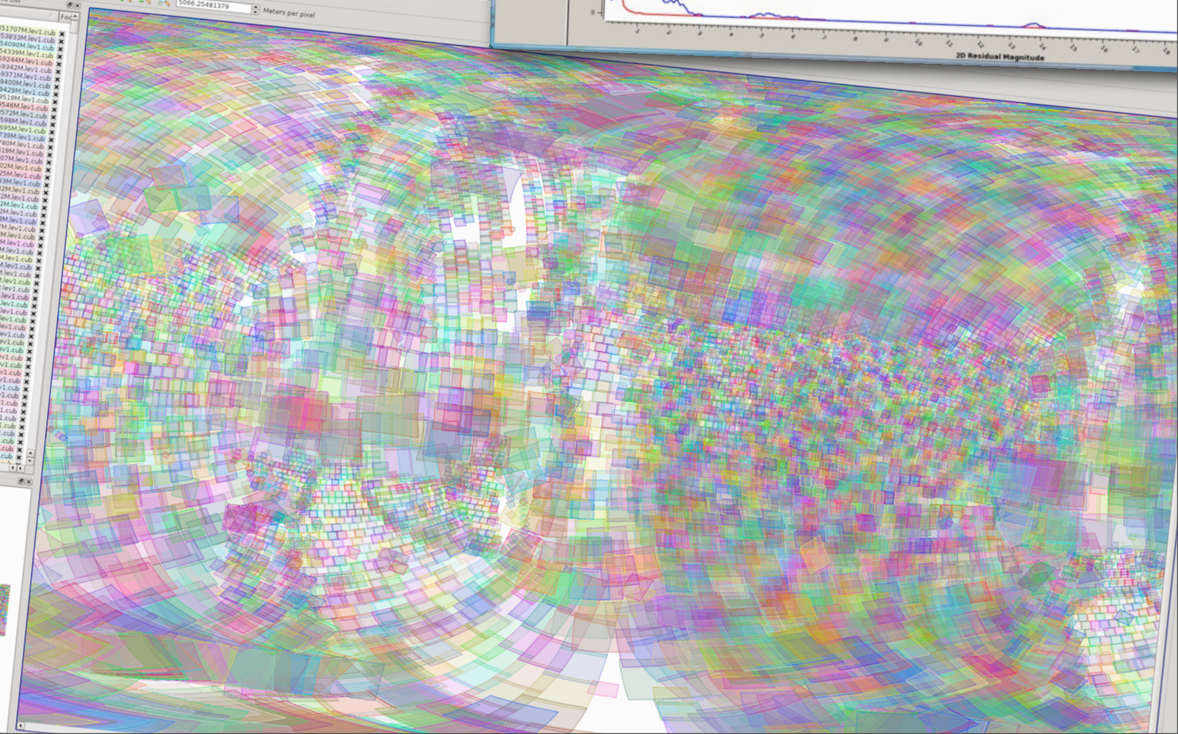
Tammy Becker
Ken Edmundson
Steven Lambright
Tracie Sucharski
Orrin Thomas

U.S. Geological Survey
Astrogeology / Geomatics Team

Photogrammetric Control in ISIS







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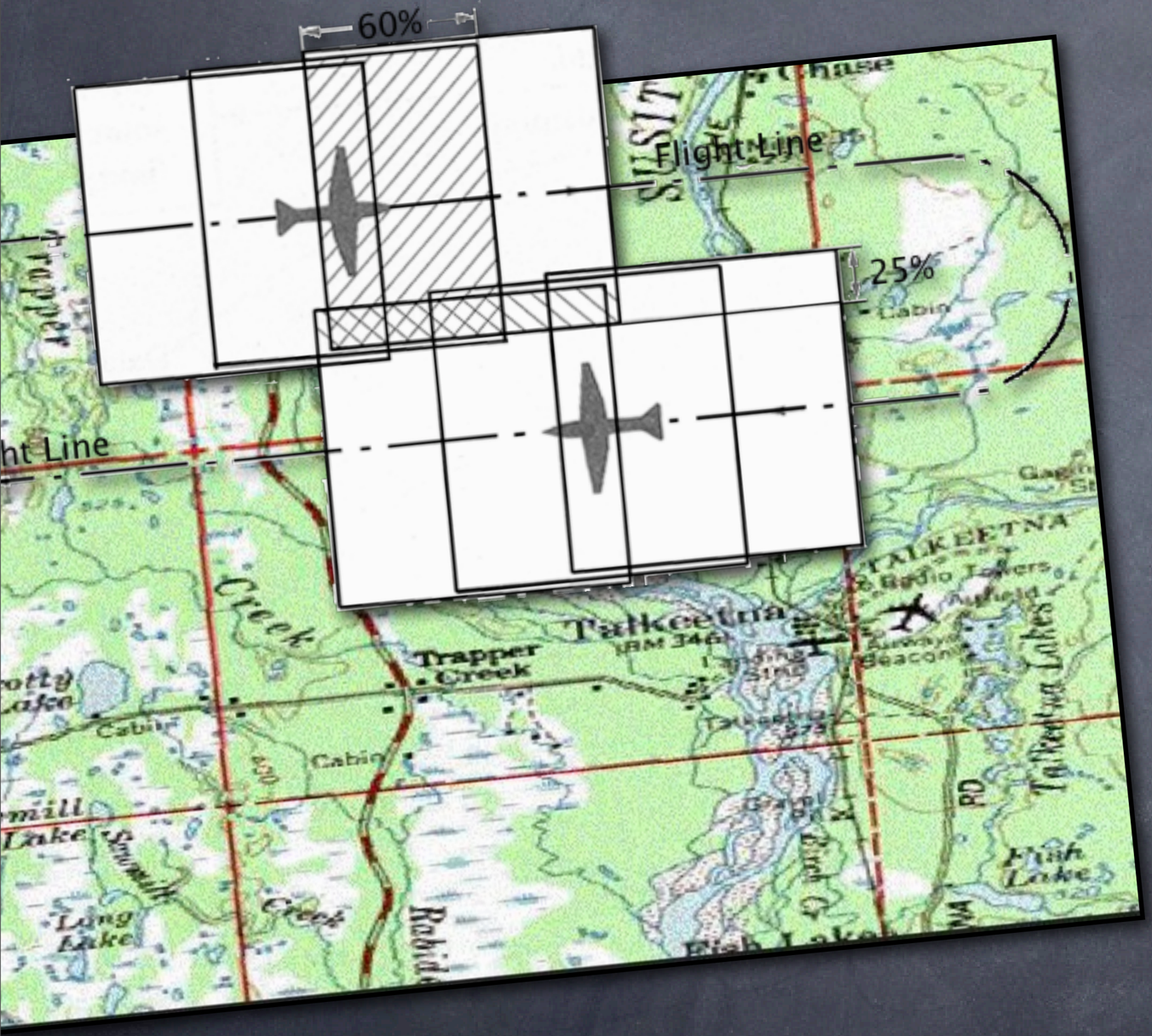
Photogrammetry



the science of making reliable measurements by the use of photographs and especially aerial or satellite photographs (as in surveying)

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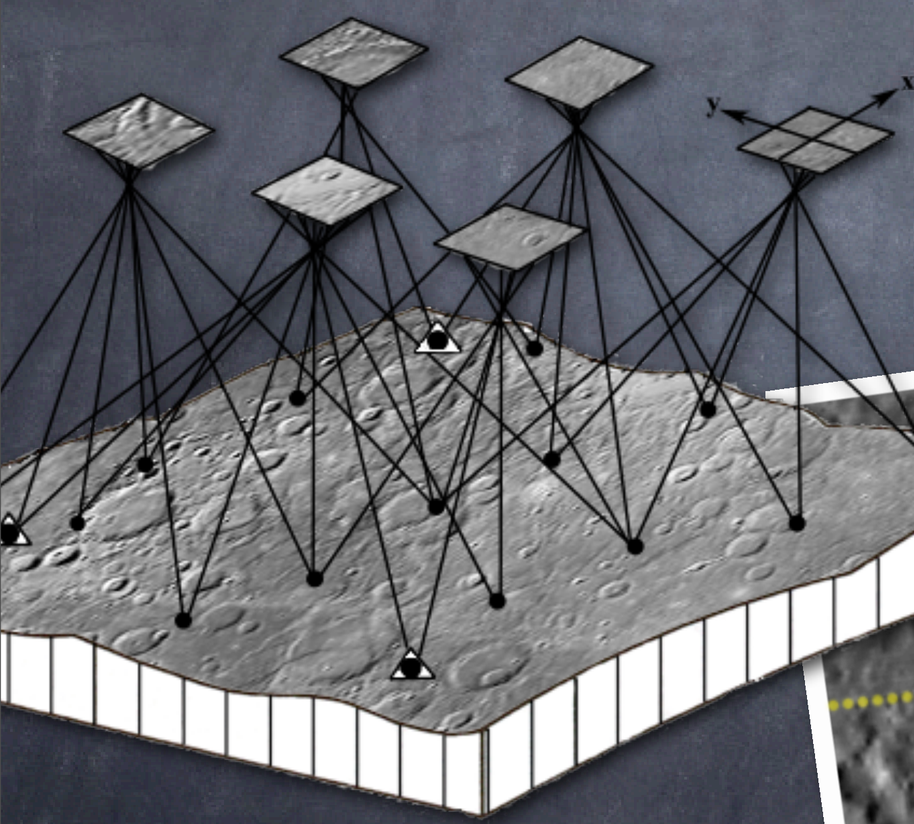
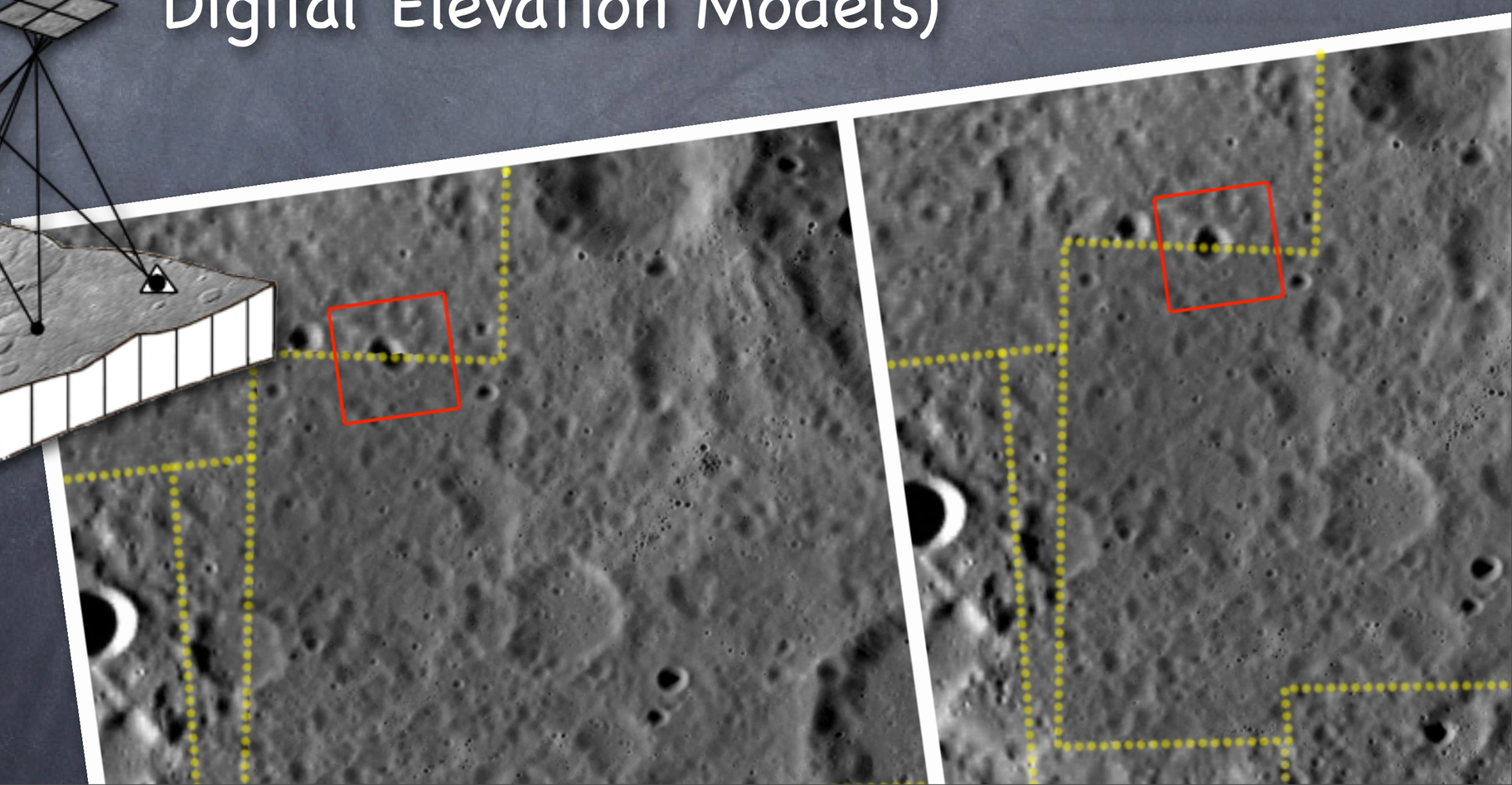
Why Photogrammetric Control?

Errors in image position and pointing parameters propagate to final mapping products (e.g., Digital Image Maps, Digital Elevation Models)





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What is Photogrammetric Control?

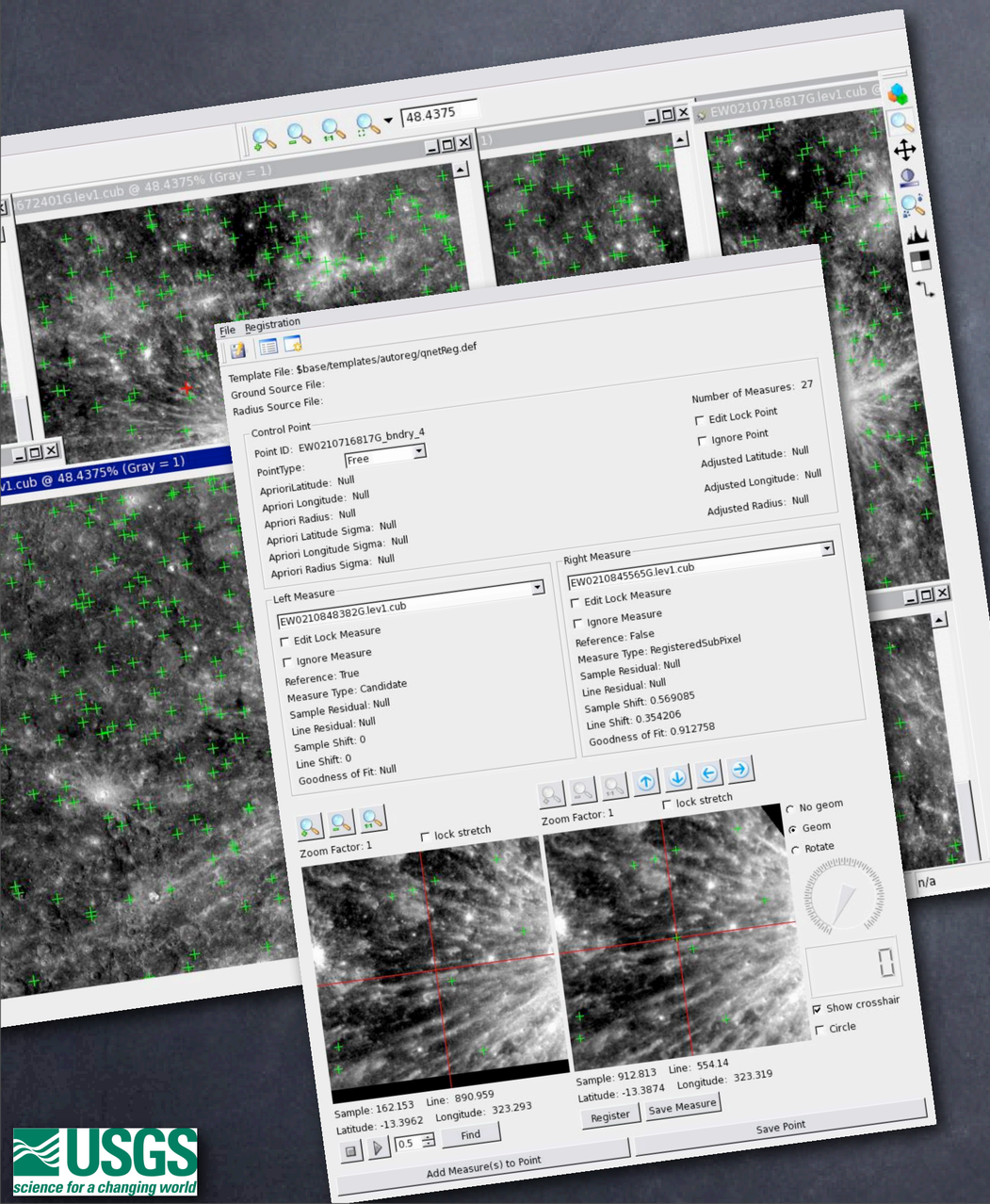

Image Measurement

Images are registered to each other and/or the ground through the measurement of common features.

- tie points: features common between overlapping images.
- control points: features common between images and base maps, DEMs, or human artifacts such as landers, rovers, or retroreflectors.

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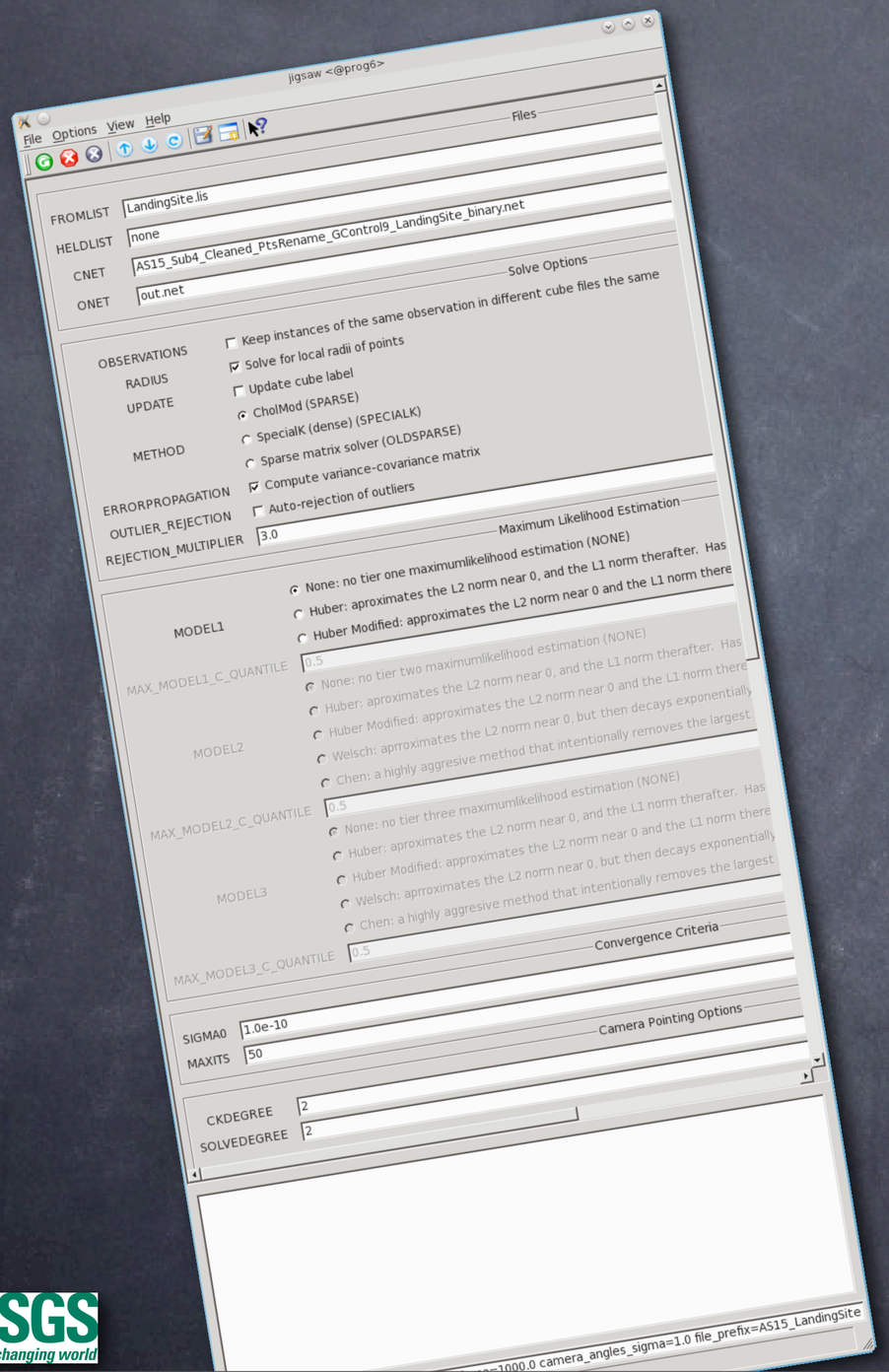

Least Squares Bundle Adjustment

Input

- Image Measurements.
- Initial values for image pointing/position and ground point coordinates.
- 'a priori' precisions for above parameters if available.

Output

- Refined image pointing/position and ground point coordinates.
- Their uncertainties.
- Solution statistics.

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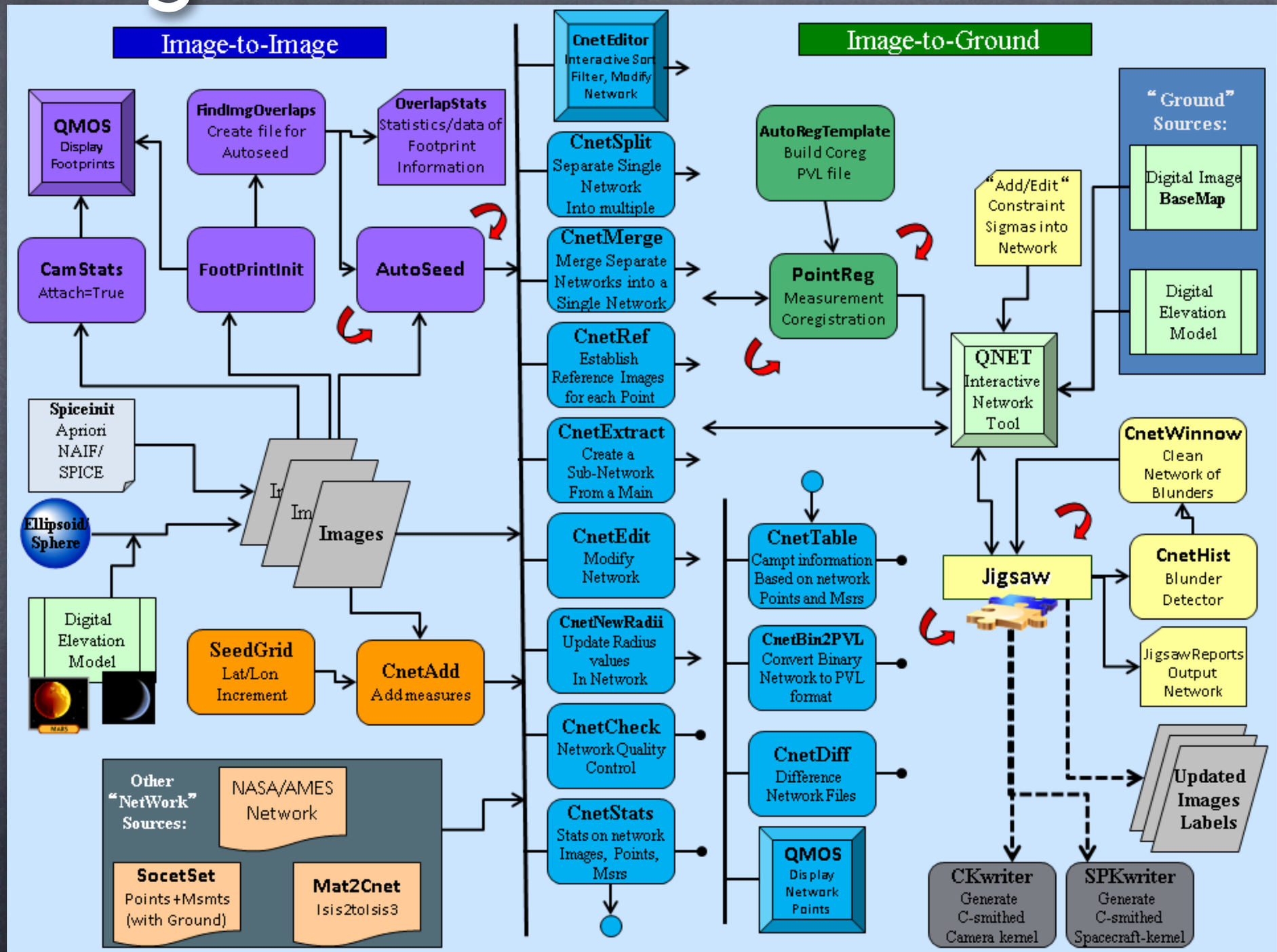
Photogrammetric Control in ISIS



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ISIS Control Application Demos

Topic	Description	Presenter
qnet	create and edit control networks	Tammy Becker/Tracie Sucharski
jigsaw	bundle adjustment	Ken Edmundson
robust blunder detection	bundle adjustment, con't	Orrin Thomas
qtie	update pointing on a single cube	Tammy Becker/Tracie Sucharski
qview	display/analysis of cubes	Steven Lambright/ Tammy Becker
qmos	display/analysis of cube footprints	Steven Lambright/ Tammy Becker

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