



$A \rightarrow \Omega$
Probes

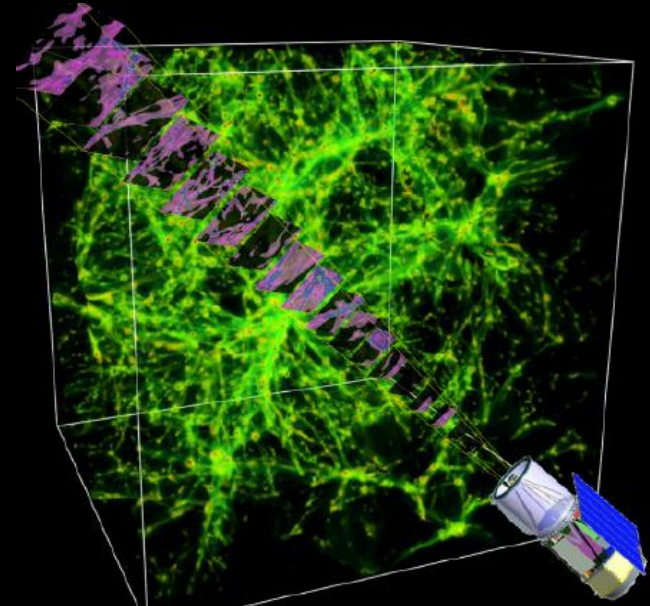
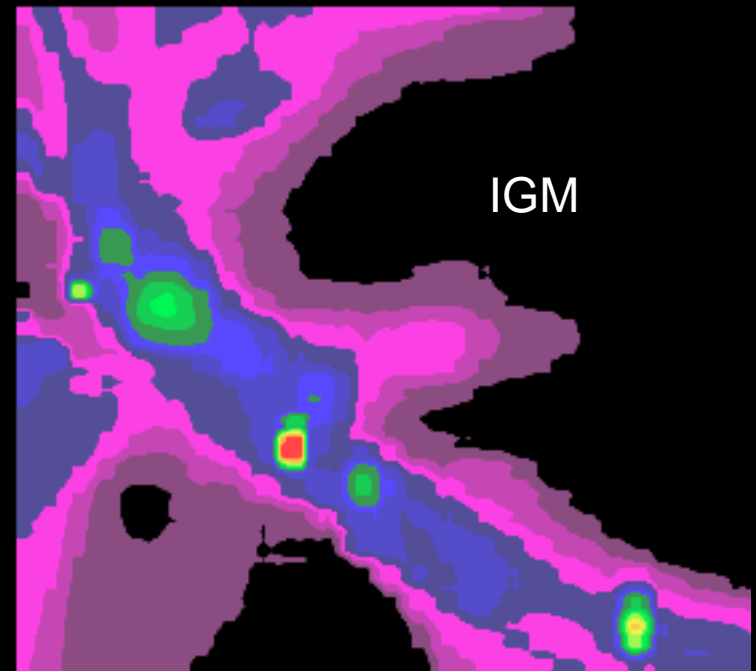
Christopher Martin
Caltech

$\alpha \rightarrow \Omega$

*Following the flow of
Baryons from the
Cosmic Web to Planets*

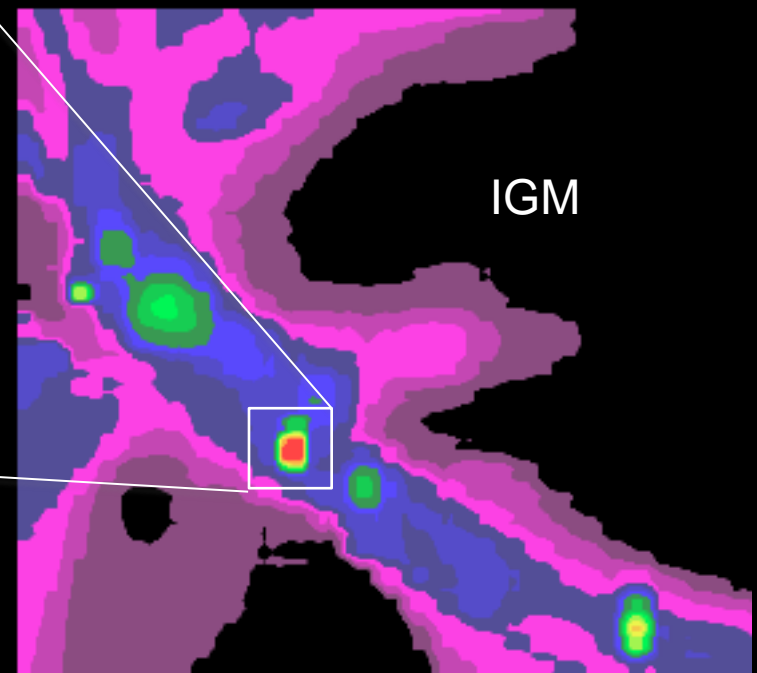
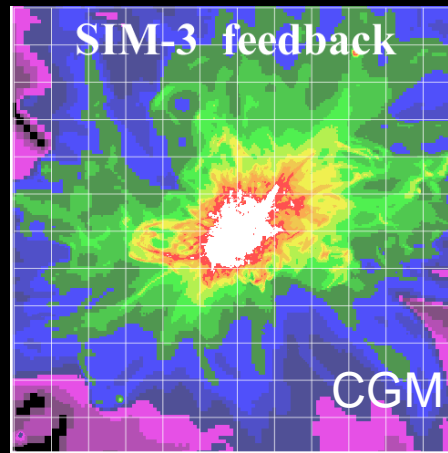
IGM ($\delta \sim 1-100$)

- α : High Resolution UV Absorption Spectroscopy (Multi-object? Tomography?)
- α : Mod Resolution UV Emission Integral Field Spectroscopy (IFS)
- α : Mod Resolution Multi-Object-Spectroscopy (MOS)



$\alpha \rightarrow \Omega$

Following the flow of Baryons from the Cosmic Web to Planets

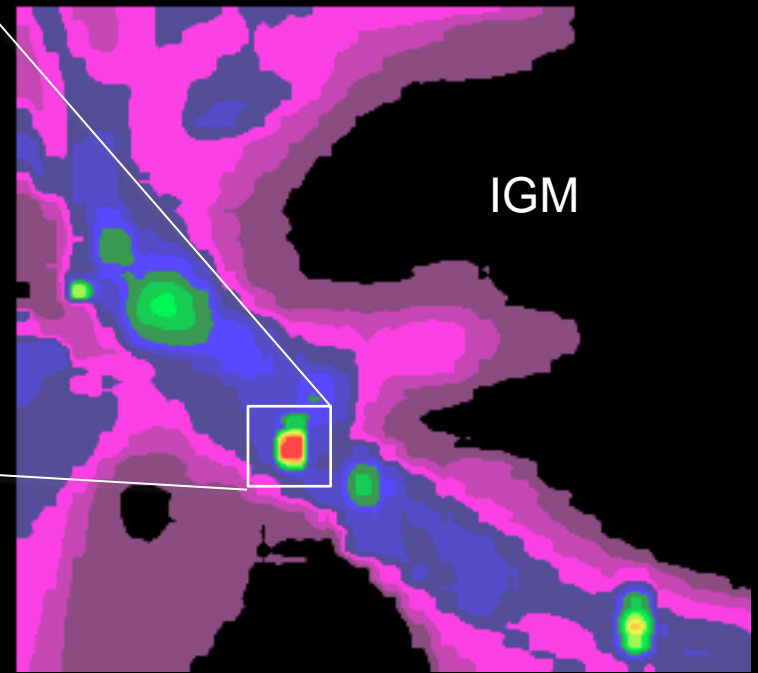
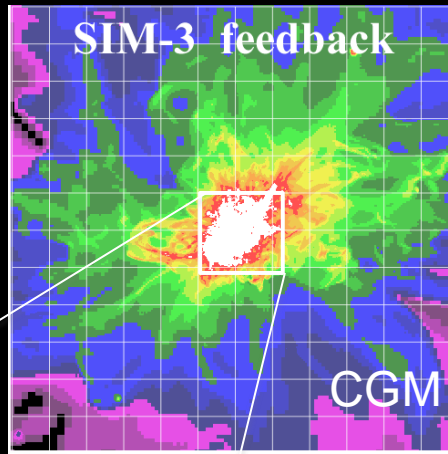


CGM ($\delta \sim 10^2 - 10^4$)

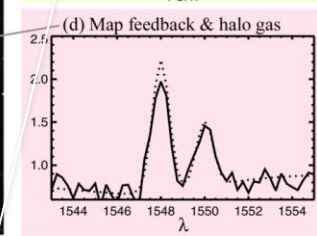
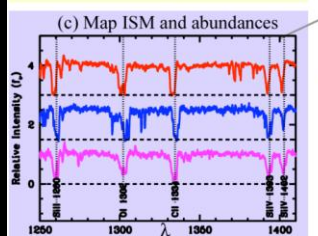
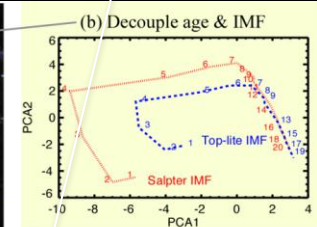
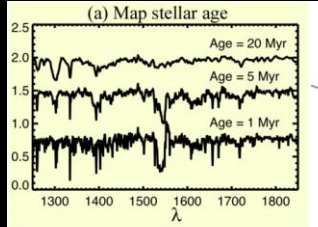
- α : High Resolution UV Absorption Spectroscopy (Multi-object? Tomography)
- α : Mod Resolution UV Emission Integral Field Spectroscopy (IFS)
- α : Mod Resolution Multi-Spectroscopy

$\alpha \rightarrow \Omega$

Following the flow of Baryons from the Cosmic Web to Planets



Galaxies



Galaxies ($\delta \sim 10^4 - 10^8$)

α : Mod-High Resolution UV Emission IFS

α : Mod Resolution Multi-Object Spectroscopy

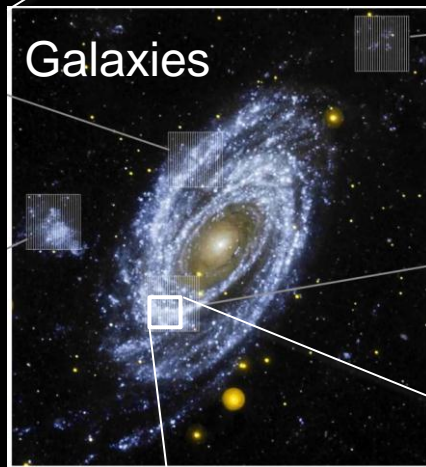
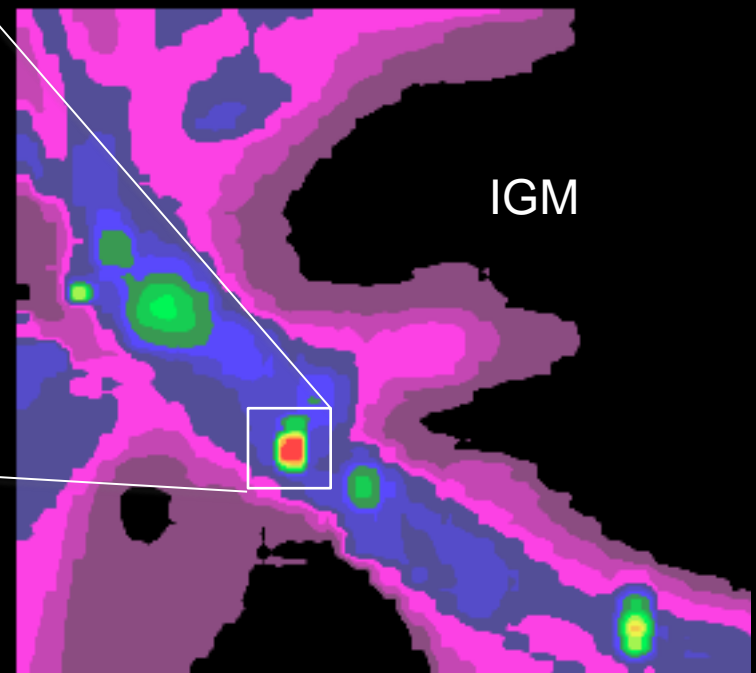
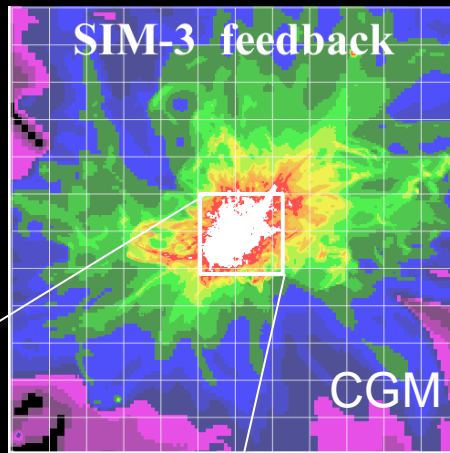
α : Wide field UV/Optical Imaging

Φ : Far IR/Sub mm imaging/spectroscopy

Ω : High contrast imaging (Galaxy/AGN co-evol)

$\alpha \rightarrow \Omega$

Following the flow of Baryons from the Cosmic Web to Planets

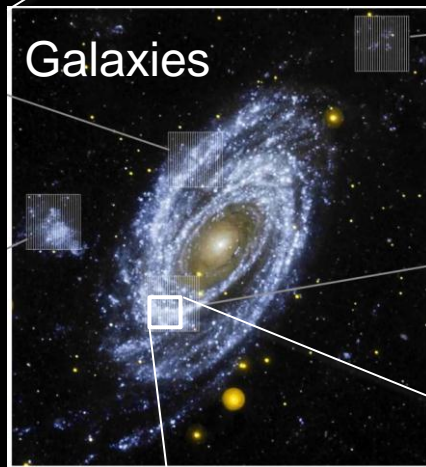
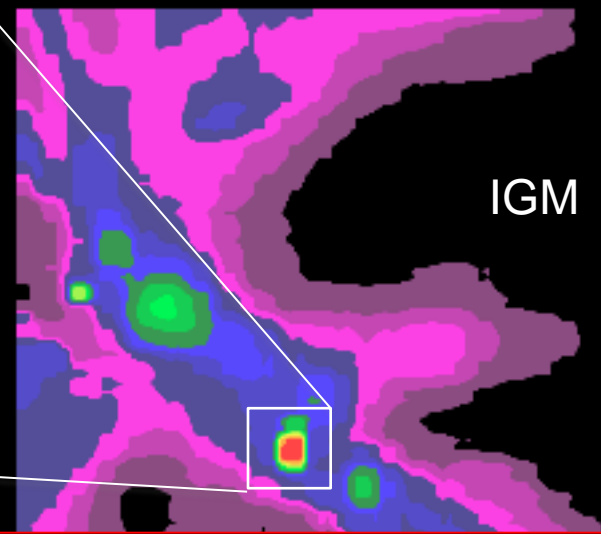
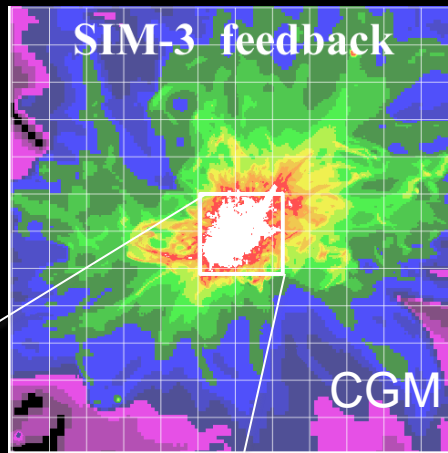


Clusters/GMCs ($\delta \sim 10^8 - 10^{10}$)

- \langle : Wide field UV/Optical Imaging
- \langle : Mod-High Resolution UV Emission IFS
- \langle : Mod Resolution UV Multi-Object Spectroscopy
- Φ : Far IR/Sub-mm imaging/spectroscopy

$\alpha \rightarrow \Omega$

Following the flow of Baryons from the Cosmic Web to Planets



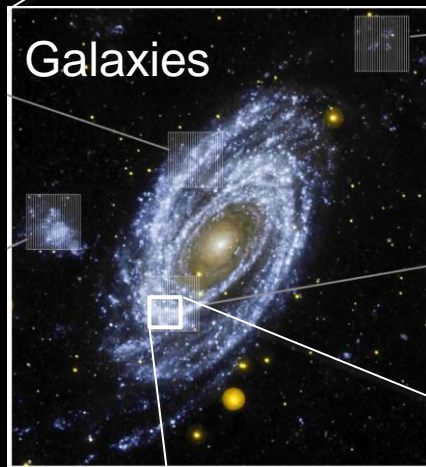
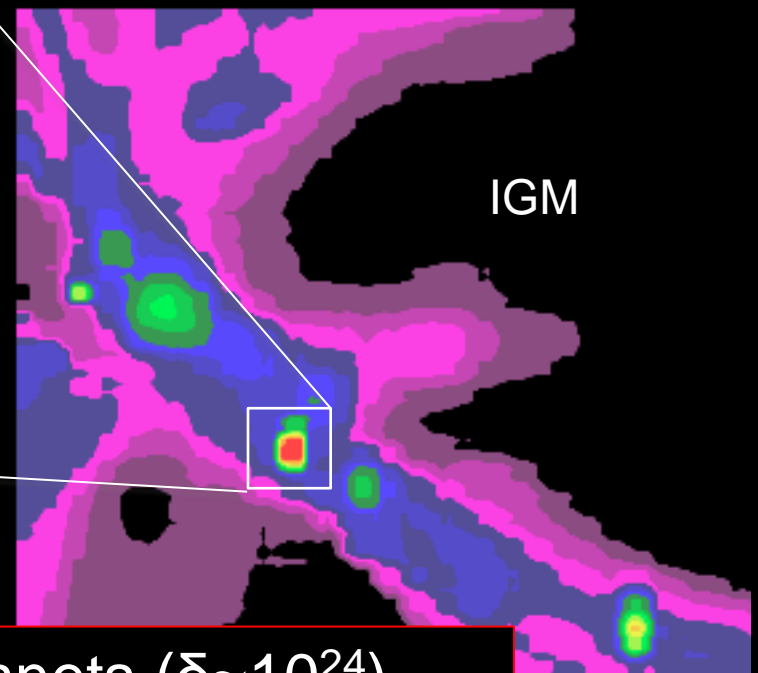
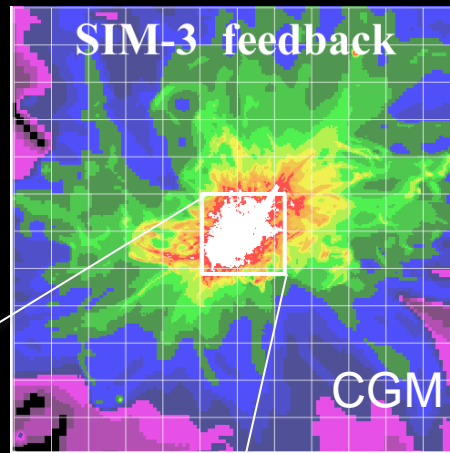
Protostars/PPDs/Young Stars ($\delta \sim 10^{16} - 10^{19}$)

- Φ : Far IR/Sub mm imaging/spectroscopy
- Ω : High Contrast optical Imaging/Sp
- α : Wide field UV/Optical Imaging
- α : High Resolution UV spectroscopy
- α : Mod-High Angular Resolution UV Emission IFS



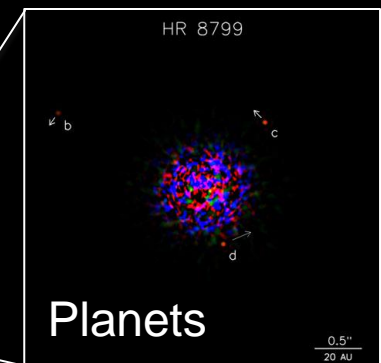
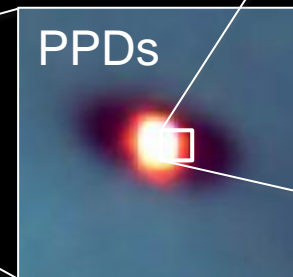
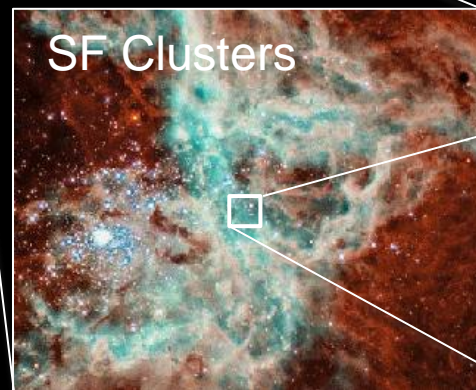
$\alpha \rightarrow \Omega$

Following the flow of Baryons from the Cosmic Web to Planets



Giant Planets ($\delta \sim 10^{24}$)

- Ω : High Contrast Imaging
- Ω : High Angular Resolution, Low Spectral Resolution IFS

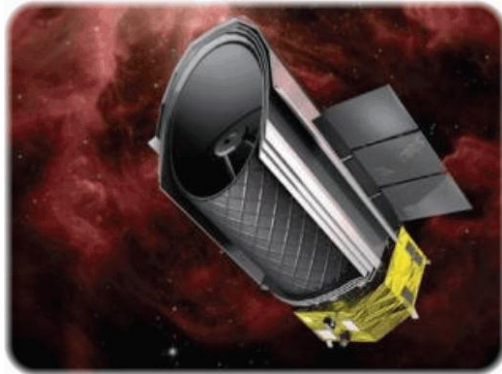


Probe 1 – Alpha α

- Wide-field
 - ~1.5 m
 - Wide-field UVO imaging
 - Massively multi-object UV Spectroscopy
 - low, medium, high R?
 - Wide-field UV Integral Field Spectrograph
- Science
 - IGM/CGM emission/absorption, tomograph?
 - Galaxy gas, star formation history, feedback
 - Star Formation Region gas physics, PDRs
 - Protoplanetary Disk gas physics
 - General astrophysics
- Technology Demonstration
 - High efficiency UV coatings, detectors

Probe 2 – Phi Φ

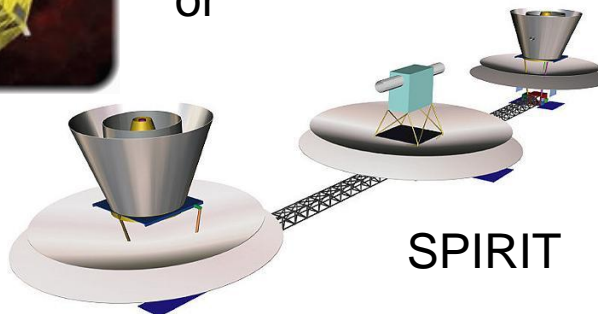
- Far IR/Sub-mm
 - Single aperture imaging and spectroscopy (SPICA?)



SPICA

ometry

or



SPIRIT

- Science
 - Obscured Star Formation region gas physics, PDRs, dust
 - Protoplanetary Disk gas physics
 - Conditions for Habitability of Exoplanetary Systems
 - General astrophysics
- Technology Demonstration
 - Balloon interferometer?

Probe 3 – Omega Ω

- Narrow-field
 - ~1.5 m
 - Dedicated O/UV (0.1-1 [2?] μm)
 - High resolution imaging
 - High contrast imaging
 - High resolution/contrast imaging spectroscopy
- Science
 - Physics of star formation
 - Proto-planetary disk structure
 - Giant planets imaging & characterization
 - AGN formation, evolution, & feedback
- Technology demonstration
 - High-contrast imaging
 - UV compatibility
 - Starshade?