

COS-GTO: Cold ISM

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Scientific Category: ISM AND CIRCUMSTELLAR MATTER

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MEDIUM, WINDS/OUTFLOWS/MASS-LOSS

Abstract

With the COS, we will be able to observe interstellar spectra in a new regime, translucent clouds, for atomic, ionic, and molecular lines and bands, and extinction curves. The COS will allow us to observe stars with total visual extinctions up to 10 magnitudes, and the grain size indicator R_v up to 4.5. In translucent clouds we expect to see the transition from neutral and ionized carbon to mostly C I, and then from there, we should expect to see carbon increasingly locked up in molecular form, as CO. Other species are expected to make similar transitions, so we should find detectable abundances of molecules such as H₂O, OH, CS, CH₂, SiO, and others; also, lower ionization fractions of the metallic elements - and higher depletions of those elements as well. Given that we expect to find higher depletions, we should see an altered grain size distribution, which may show up in the extinction curves, probably as lower far-UV extinction than in diffuse clouds. Finally, we will search for neutral PAHs in absorption, as diffuse bands in the UV, paralleling the optical DIBs (which are thought by some scientists to be formed by singly-ionized PAHs). In translucent clouds, models show that the PAHs will be neutral, not in cationic form.

Investigators:

	Investigator	Institution	Country
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Number of investigators: 2

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Target Summary:

Target	RA	Dec	Magnitude
NGC2024-1	05 41 37.8500	-01 54 36.50	V = 12.17 +/- 0.2, F(1300)=6.3E-16, F(1500)=4.1E-15
HD204827	21 28 57.7610	+58 44 23.24	V = 8.0 +/- 0.1, F(1300)=1.26E-14
HD147889	16 25 24.3167	-24 27 56.57	V = 7.95 +/- 0.1, F(1300) = 1.10E-12
GSC04816-01293	07 15 4.5900	-01 03 8.40	V = 12.22 +/- 0.2, F(2300)=2.29E-13
BD+631964	23 17 21.5615	+64 07 16.16	V = 8.49 +/- 0.1, F(1300) = 2.84E-13
VI-CYG-8A	20 33 15.0789	+41 18 50.49	V = 8.99 +/- 0.1, F(1300)=8.38E-15
BD+31643	03 44 34.1865	+32 09 46.11	V = 8.68
HD29647	04 41 8.0457	+25 59 33.95	V = 8.46, F(1300) = 5.62E-15

Observing Summary:

Target	Config Mode and Spectral Elements	Flags	Orbits
NGC2024-1	COS/FUV Spectroscopic G130M COS/FUV Spectroscopic G160M		5
HD204827	COS/FUV Spectroscopic G130M COS/FUV Spectroscopic G140L COS/FUV Spectroscopic G160M COS/NUV Spectroscopic G230L COS/NUV Spectroscopic G230L COS/NUV Spectroscopic G230L	CVZ	3

Target	Config Mode and Spectral Elements	Flags	Orbits
HD204827	STIS/NUV-MAMA Spectroscopic E230M (1978)	CVZ	1
	STIS/NUV-MAMA Spectroscopic E230M (2707)		
HD204827	COS/FUV Spectroscopic G130M	CVZ	3
	COS/FUV Spectroscopic G140L		
	COS/FUV Spectroscopic G160M		
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
HD204827	STIS/NUV-MAMA Spectroscopic E230M (1978)	CVZ	1
	STIS/NUV-MAMA Spectroscopic E230M (2707)		
HD147889	COS/FUV Spectroscopic G140L		2
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
HD147889	STIS/FUV-MAMA Spectroscopic E140M (1425)		3
	STIS/NUV-MAMA Spectroscopic E230M (1978)		
	STIS/NUV-MAMA Spectroscopic E230M (2707)		
GSC04816-01293	COS/NUV Spectroscopic G230L		1
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
BD+631964	COS/FUV Spectroscopic G130M	CVZ	2
	COS/FUV Spectroscopic G160M		
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
	COS/FUV Spectroscopic G140L		
BD+631964	STIS/NUV-MAMA Spectroscopic E230M (1978)	CVZ	1

Target	Config Mode and Spectral Elements	Flags	Orbits
	STIS/NUV-MAMA Spectroscopic E230M (2707)		
VI-CYG-8A	COS/FUV Spectroscopic G130M		2
VI-CYG-8A	COS/FUV Spectroscopic G160M		3
	COS/FUV Spectroscopic G140L		
VI-CYG-8A	COS/NUV Spectroscopic G230L		4
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
BD+31643	COS/FUV Spectroscopic G130M		3
	COS/FUV Spectroscopic G160M		
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
BD+31643	STIS/NUV-MAMA Spectroscopic E230M (1978)		3
	STIS/NUV-MAMA Spectroscopic E230M (2707)		
HD29647	COS/FUV Spectroscopic G130M		4
HD29647	COS/FUV Spectroscopic G160M		3
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
	COS/NUV Spectroscopic G230L		
HD29647	STIS/NUV-MAMA Spectroscopic E230M (1978)		4
HD29647	STIS/NUV-MAMA Spectroscopic E230M (2707)		2
NGC2024-1	COS/FUV Spectroscopic G130M		10 (5x2)
NGC2024-1	COS/FUV Spectroscopic G130M		5
	COS/FUV Spectroscopic G160M		

Total prime orbits: 65

This is a COS GTO project, no scientific justification is needed.