



# COO/Palomar Observatory



## Cover Sheet - Semester 2017A

### 200-inch Telescope

**Instructions:** Fill in the required information. When finished, save the form on your computer as a pdf document to be merged with the discussion section of your proposal.

#### Principal Investigator

Name: Philip Appleton

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Office phone: 626-295-3119

#### Lead Observer (if not PI)

*The PI or the Lead Observer will be the single-point contact with the Palomar staff for all administrative and logistical matters pertaining to the project.*

#### Program Title

Shocked Gas in Extreme LINERs

**Abstract of Program** Abstract must fit within the space provided. *Unformatted text only.*

We have identified a rare sample of LINER galaxies ( $0.08 < z < 0.16$ ) from the SDSS which have unusually large [O I]/H $\alpha$  line ratios and very broad lines. Although LINERs are often associated with low-luminosity AGN, these particular line ratios fall very far from the usual AGN/LINER tracks, and into the region most easily explained by an ISM entirely suffused by shocks. We will test this idea by searching for shock-indicators of molecular-hydrogen, kinematic signatures of a shocked-outflow (from possible hidden AGN) or evidence of generally diffuse emission to determine how these galaxies might fit into the overall picture of galaxy evolution.

*Note: The abstract may be used for Educational Outreach purposes.*

Institution <input type="text" value="Caltech"/>	Status <sup>1</sup> <input type="text" value="Senior Research Staff"/>	Priority <input type="text" value="Principal"/>
Linked to Keck <sup>1</sup> <input type="text" value="No"/>	Linked to 60-in <sup>1</sup> <input type="text" value="No"/>	Linked to Oschin <sup>1</sup> <input type="text" value="No"/>
Thesis Project <input type="text" value="No"/>	ToO Interrupts <sup>1</sup> <input type="text" value="No"/>	Large Project <sup>1</sup> <input type="text" value="No"/>
Date-Specific <sup>2</sup> <input type="text" value="No"/>	Partial Nights <sup>2</sup> <input type="text" value="No"/>	New/Continuing Project <sup>3</sup> <input type="text" value="New"/>

<sup>1</sup>Caltech observers only

<sup>2</sup>Provide full details in the discussion section.

<sup>3</sup>For a new project, include in the discussion section an estimate of the total observing time needed for completion. For a continuation of an existing project, give a review of its status and an estimate of the observing time needed for completion.

#### Collaborators (Names and e-mail addresses)

Jeff Rich (Carnegie) jeff.rich.jr@gmail.com, Patrick Ogle (IPAC) ogle@ipac.caltech.edu Katherine Alatalo (Carnegie) kalatalo@carnegiescience.edu, Ute Lisenfeld (Granada) ute@ugr.es  
Mark Lacy (NRAO) mlacy@nrao.edu, Dario Fadda dfadda@sofia.usra.edu  
Lauranne Lanz (Dartmouth) lauranne.lanz@dartmouth.edu









































































**Observing Team** (Observers expected to be present at Palomar)

Appleton, plus one other of local team (Rich, Alatalo)

**Observing Runs & Instruments** Fill in the table below to specify the instruments requested and your acceptable observing runs.

- Select the **instrument(s)** you are requesting for the block from the pull-down menus. Double-instrument set-ups should not be requested unless both instruments are to be used during the scheduled block.
- Enter the **number of nights** you are requesting for the block.
- Specify your observing preferences as **P** = Preferred or **A** = Acceptable
- Use multiple request lines if you want your observing time split into two or more blocks (one line for each block).

L = Light (<28% moon-free)	D = Dark (>72% moon-free)
DE = Grey Dark Early (28%-72% moon-free)	DL = Grey Dark Late (28%-72% moon-free)

Observing Time Preference & Instrument Selection 2017A												
From				01 Feb	05 Feb	15 Feb	20 Feb	02 Mar	06 Mar	17 Mar	21 Mar	31 Mar
To				04 Feb	14 Feb	19 Feb	01 Mar	05 Mar	16 Mar	20 Mar	30 Mar	03 Apr
		Approx RA @ Midnight			09:15-11:00				11:00-13:00			
Block	Cass#	Prime#	Nights	1DL	2L	2DE	2D	2DL	3L	3DE	3D	3DL
Blk 1	TripleSpec 	None 	3 					A 	A 	A 	A 	A 
Blk 2	None 	None 										
Blk 3	None 	None 										
Blk 4	None 	None 										
Blk 5	None 	None 										
Blk 6	None 	None 										

#Two-instrument requests must be fully justified, in that both instruments must be *integral* to the project.

\*For *Own Equip*, provide name (below) and full description in proposal *Discussion*.

§ *Private* or *Semi-private* instrument. Prior approval required.

&gt;

From	04 Apr	15 Apr	20 Apr	29 Apr	03 May	15 May	19 May	29 May	02 Jun	14 Jun	19 Jun	28 Jun	03 Jul	14 Jul	19 Jul	28 Jul
To	14 Apr	19 Apr	28 Apr	02 May	14 May	18 May	28 May	01 Jun	13 Jun	18 Jun	27 Jun	02 Jul	13 Jul	18 Jul	27 Jul	31 Jul
RA	13:00-15:00				15:00-17:00				17:00-19:00				19:00-20:50			
Block	4L	4DE	4D	4DL	5L	5DE	5D	5DL	6L	6DE	6D	6DL	7L	7DE	7D	7DL
Blk 1	A	A	A	A	P	A	A	A	A							
Blk 2																
Blk 3																
Blk 4																
Blk 5																
Blk 6																

**Own Equipment** (Enter name of instrument and give full description in *Discussion*)

Cass (with P3K):

Cass (without P3K):

Prime:

*Semester 2017A Palomar Cover Sheet 200-in*  
*Last updated: 24 Aug 2016 - RJB/AFB*

