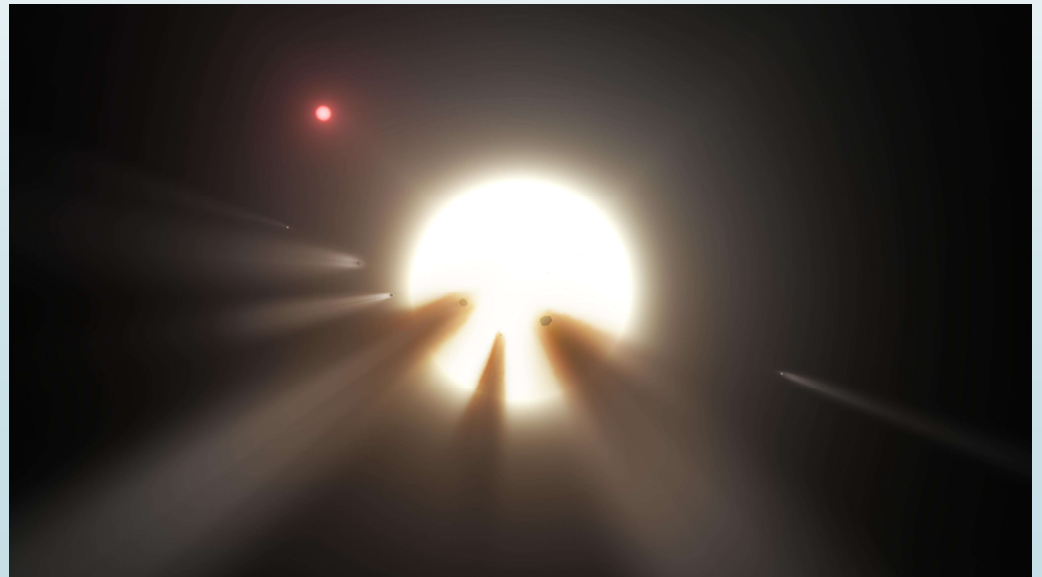


# Análisis de la curva de luz de la estrella KIC8462852

Estudiante: José Carlos Carvajal García

Tutores: Teresa García y Mauricio Reyes





# Actividades a Realizar

- Datos de Estrella
- Curva de Luz para Analizar
- Investigación Artículos Relacionados
- Reducción de Datos
- Shape
- Primeros Modelos
- \*\*\*\*
  - Empezar a probar el modelo final.
  - Curvas de luz finales.

## KI8462852 (+20h 06m 15.457s, +44° 27' 24.61")

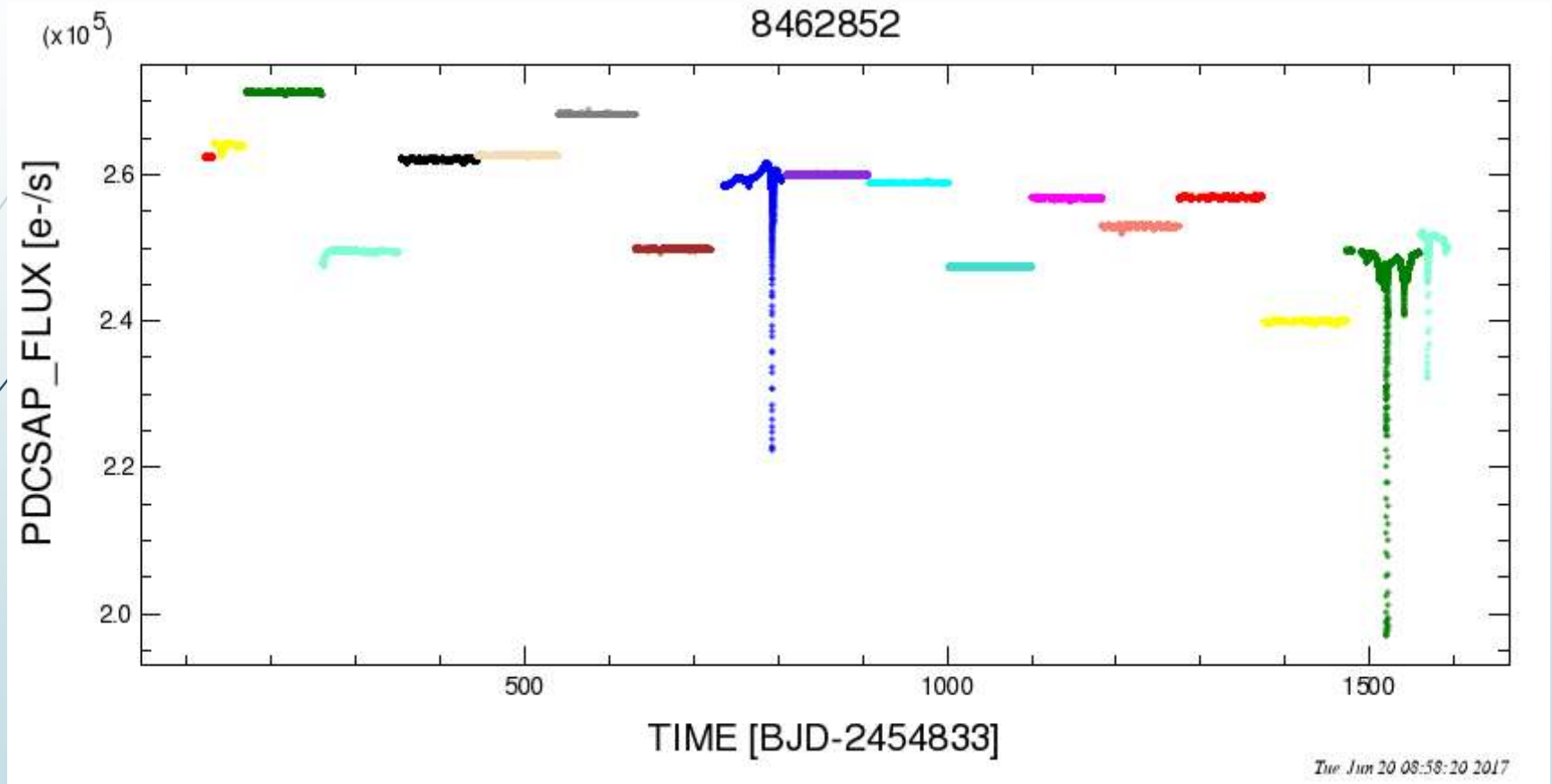


► Estrella de Tabby por Tabettha S. Boyajian.

### ► **Características :**

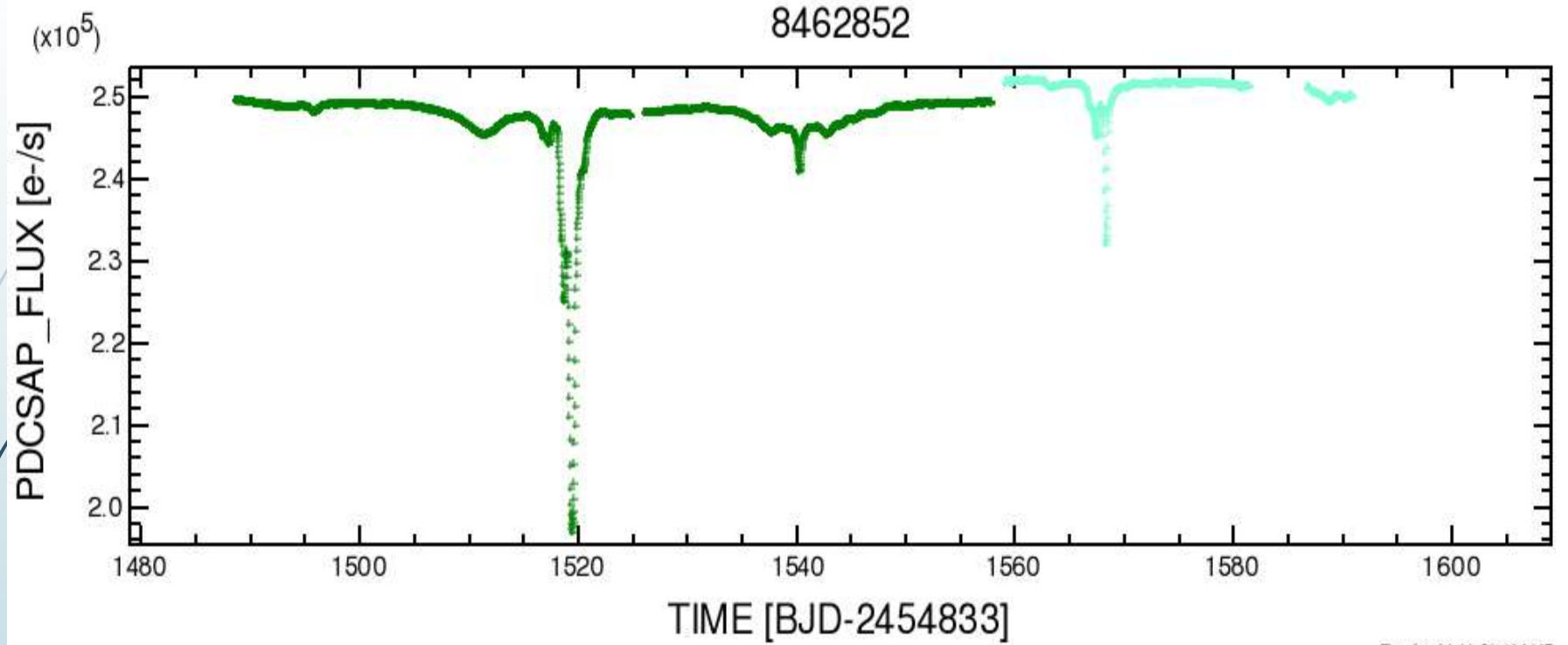
- Clasificación: F3
- Masa = 1.43 Mo
- Radio = 1.58 Ro
- Magnitud = 3.08
- Luminosidad = 4.7 Lo
- Temperatura = 6750+-120°K
- Distancia = 454 pc

# Curvas de Luz



[https://exoplanetarchive.ipac.caltech.edu/cgi-bin/ICETimeSeriesViewer/nph-ICEtimeseriesviewer?inventory\\_n](https://exoplanetarchive.ipac.caltech.edu/cgi-bin/ICETimeSeriesViewer/nph-ICEtimeseriesviewer?inventory_n)

# Curvas de Luz



Tue Jun 20 11:51:46 2017



## Reducción de Datos

- Flats, Bias, Darks.
- Limpiar de rayos cósmicos, combinar.
- Alinear.
- Análisis para obtener curva de luz.
- \*\*\* Plots.

# Artículos: Base Teórica

## KIC 8462852: Transit of a Large Comet Family

Eva H. L. Bodman, Alice Quillen

Department of Physics and Astronomy, University of Rochester

Rochester, NY 14627, USA

- Distribución de tamaños.

$$dn(s) = \frac{(1 - s_0/s)^m}{s^n}$$

- Presión de Radiación

$$P = P_0 \left( \frac{r}{r_0} \right)^{-2}$$

- "Extinction"

$$\tau = \frac{\sum_{\text{part.}} N_{\text{grain/part.}} Q_{\text{ext}}(s, \lambda) \pi s^2}{S}$$

## Photometric stellar variation due to extra-solar comets.

A. Lecavelier des Etangs<sup>1</sup>, A. Vidal-Madjar<sup>1</sup>, and R. Ferlet<sup>1</sup>

$$N_{\text{grain/part.}} = \frac{3M_{\text{dust}}}{4\pi\rho N_{\text{part.}}} \frac{\int dn(s)}{\int s^3 dn(s)}$$

$$Q_{\text{ext}}(s, \lambda) = Q_{\text{sca}} + Q_{\text{abs}}$$

$$Q_{\text{abs}} = 1 \text{ if } s \geq \lambda.$$

$$Q_{\text{abs}} = s/\lambda \text{ if } s < \lambda$$

$$s \geq \lambda.$$

$$Q_{\text{sca}} = Q_D = 1$$

$$s < \lambda$$

$$Q_{\text{sca}} = (s/\lambda)^4$$

# Artículos: Antecedentes

## KIC 8462852: Transit of a Large Comet Family

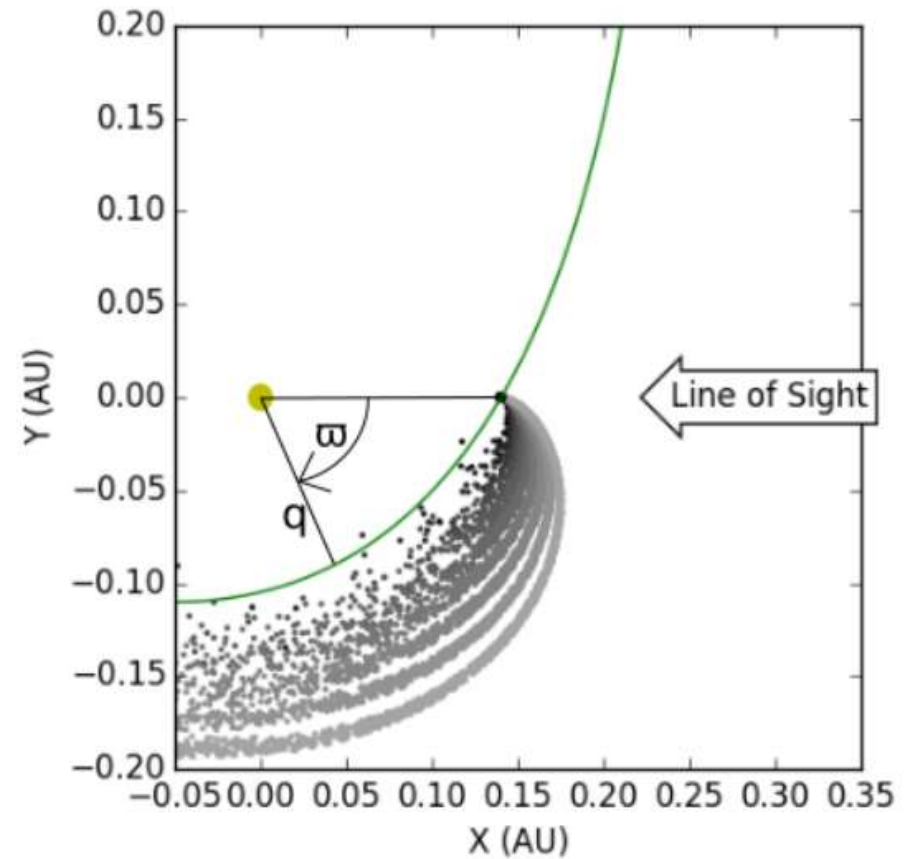
Eva H. L. Bodman, Alice Quillen

Department of Physics and Astronomy, University of Rochester

Rochester, NY 14627, USA

$$P(r) = P_0 \left( \frac{r_0}{r} \right)^2 \left( \frac{L_\star}{L_\odot} \right)$$

$$\tau = \frac{\sum_{\text{part.}} N_{\text{grain/part}} Q_{\text{ext}}(s, \lambda) \pi s^2}{S}$$





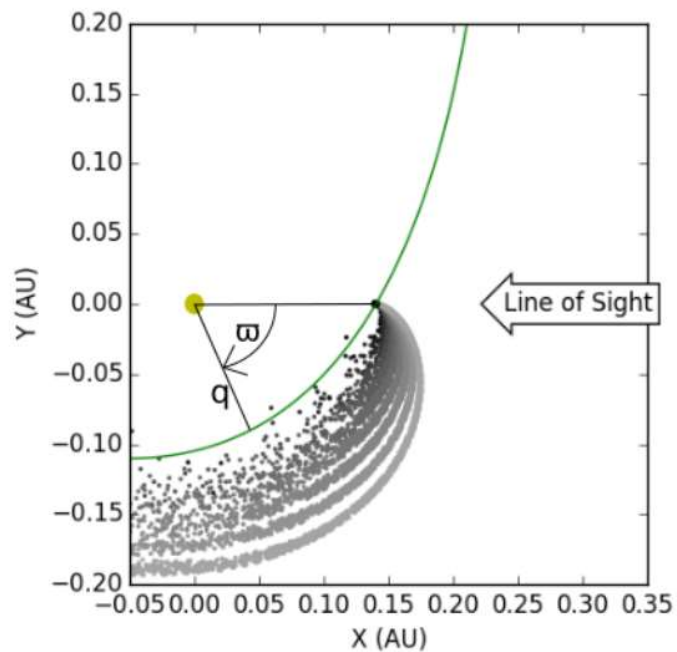
# Artículos: Antecedentes

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P8 ( $R_{\text{comet}} \lesssim 100 \text{ km}$ )

P6 ( $R_{\text{comet}} \lesssim 10 \text{ km}$ )

Group	$q$ (AU)	$P_0$ ( $\text{kg s}^{-1}$ )	$\Delta t$ (hr)	$N_{\text{comets}}$	$P_0$	$\Delta t$	$N_{\text{comets}}$
1	0.2	$10^7$	9	12	$10^6$	5	65
2	0.1	$10^7$	7	5	$10^6$	3	27
3	0.1	$10^8$	0.9	36/10	$10^6$	0.2	441/341
4	0.1	$10^7$	12	5	$10^6$	8	37
5	0.1	$10^8$	3	3	$10^6$	0.7	24/8
6	0.1	$10^7$	7	3	$10^6$	8	24
7	0.1	$10^8$	5	9 / 3	$10^6$	1	113/60
Total Comets:				73			731

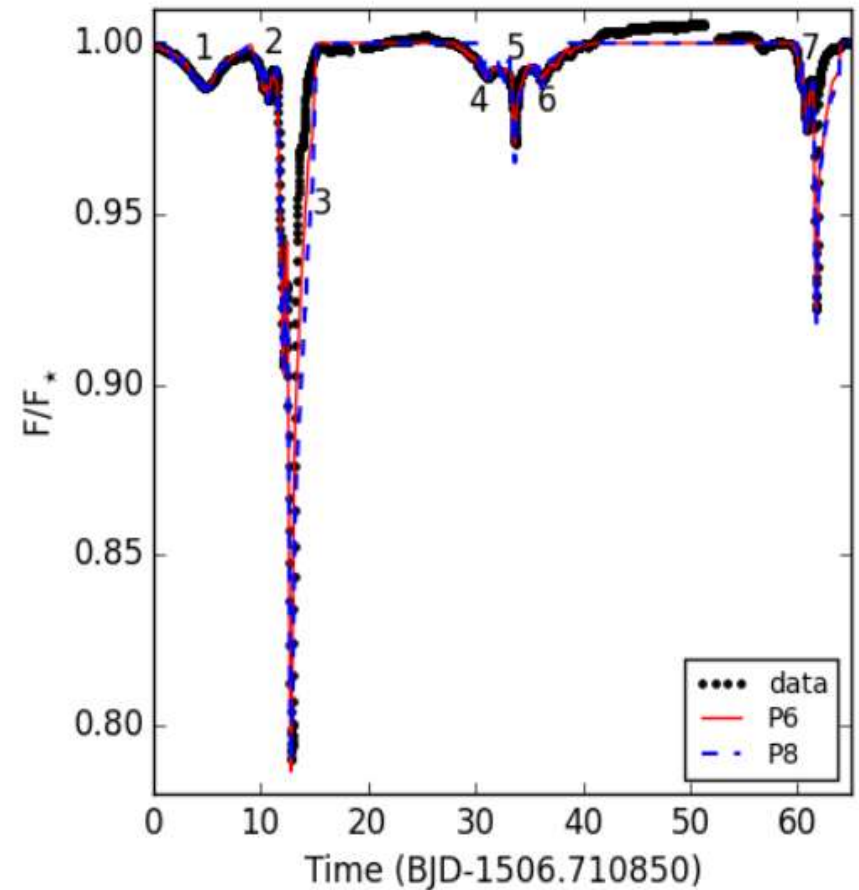
# Artículos: Antecedentes

## KIC 8462852: Transit of a Large Comet Family

Eva H. L. Bodman, Alice Quillen

Department of Physics and Astronomy, University of Rochester  
Rochester, NY 14627, USA

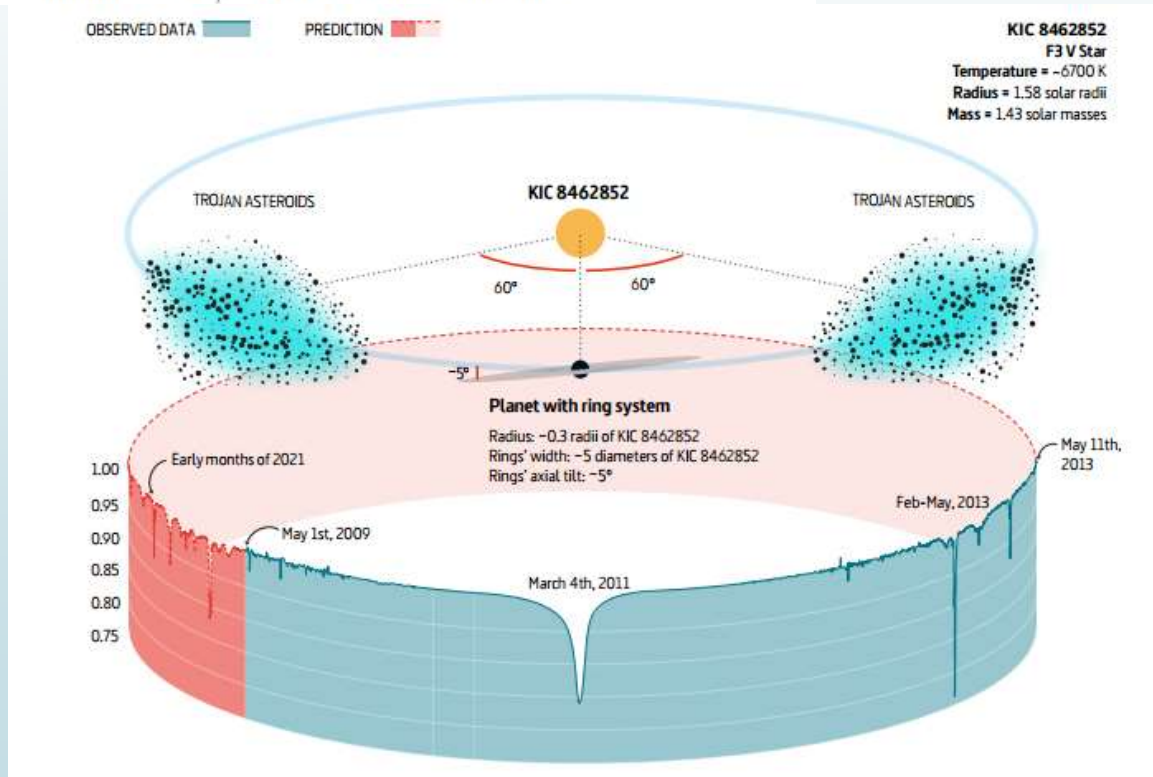
Group	$q$ (AU)	P8 ( $R_{\text{comet}} \lesssim 100$ km)			P6 ( $R_{\text{comet}} \lesssim 10$ km)		
		$P_0$ (kg s $^{-1}$ )	$\Delta t$ (hr)	$N_{\text{comets}}$	$P_0$	$\Delta t$	$N_{\text{comets}}$
1	0.2	$10^7$	9	12	$10^6$	5	65
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7	0.1	$10^8$	5	9 / 3	$10^6$	1	113/60
Total Comets:				73	731		



# Artículos: Interesante

## KIC 8462852: Will the Trojans return in 2021?

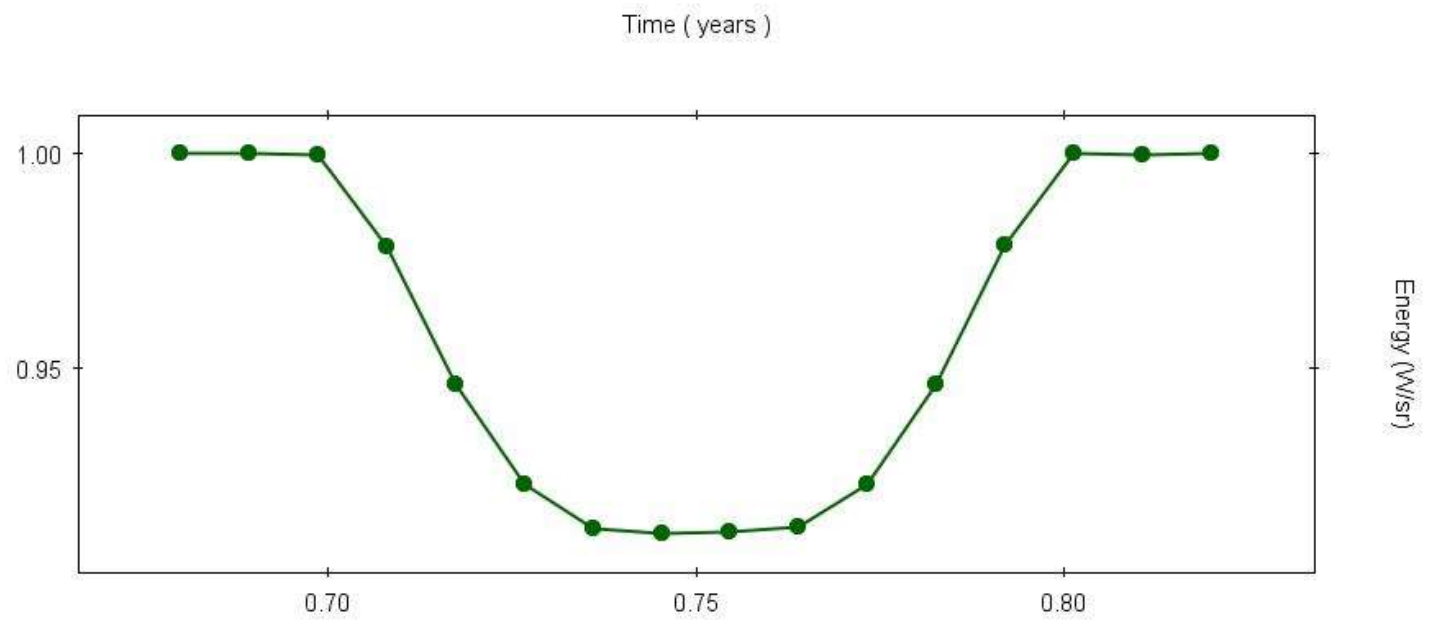
Fernando J. Ballesteros,<sup>1\*</sup> Pablo Arnalte-Mur,<sup>1,2</sup>  
Alberto Fernández-Soto,<sup>3,4</sup> and Vicent J. Martínez<sup>1,2,4</sup>



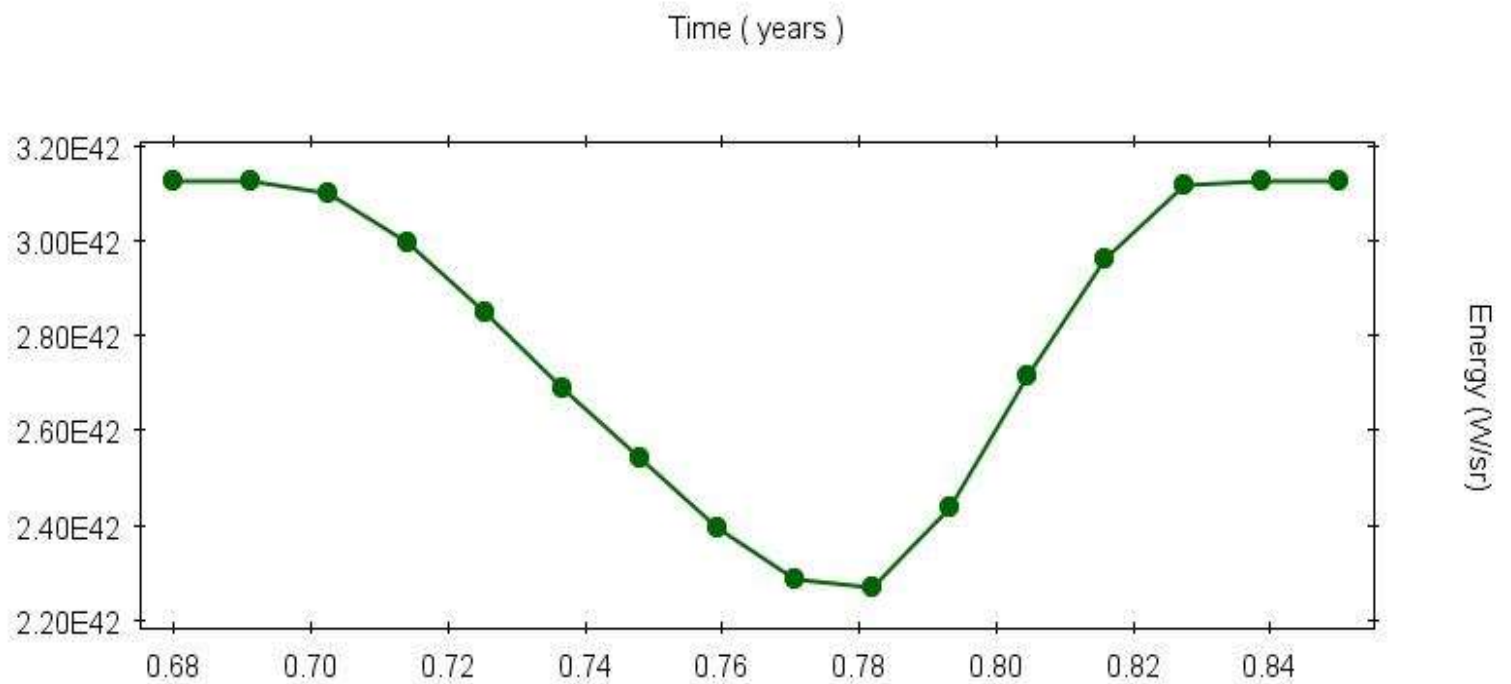


Shape

# Primeros Resultados Planeta



# Primeros Resultados Cometa



## Próximos Resultados

Group	$q$ (AU)	P8 ( $R_{\text{comet}} \lesssim 100$ km)			P6 ( $R_{\text{comet}} \lesssim 10$ km)		
		$P_0$ (kg s $^{-1}$ )	$\Delta t$ (hr)	$N_{\text{comets}}$	$P_0$	$\Delta t$	$N_{\text{comets}}$
1	0.2	$10^7$	9	12	$10^6$	5	65
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3	0.1	$10^8$	0.9	36/10	$10^6$	0.2	441/341
4	0.1	$10^7$	12	5	$10^6$	8	37
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7	0.1	$10^8$	5	9 /3	$10^6$	1	113/60
Total Comets:				73	731		



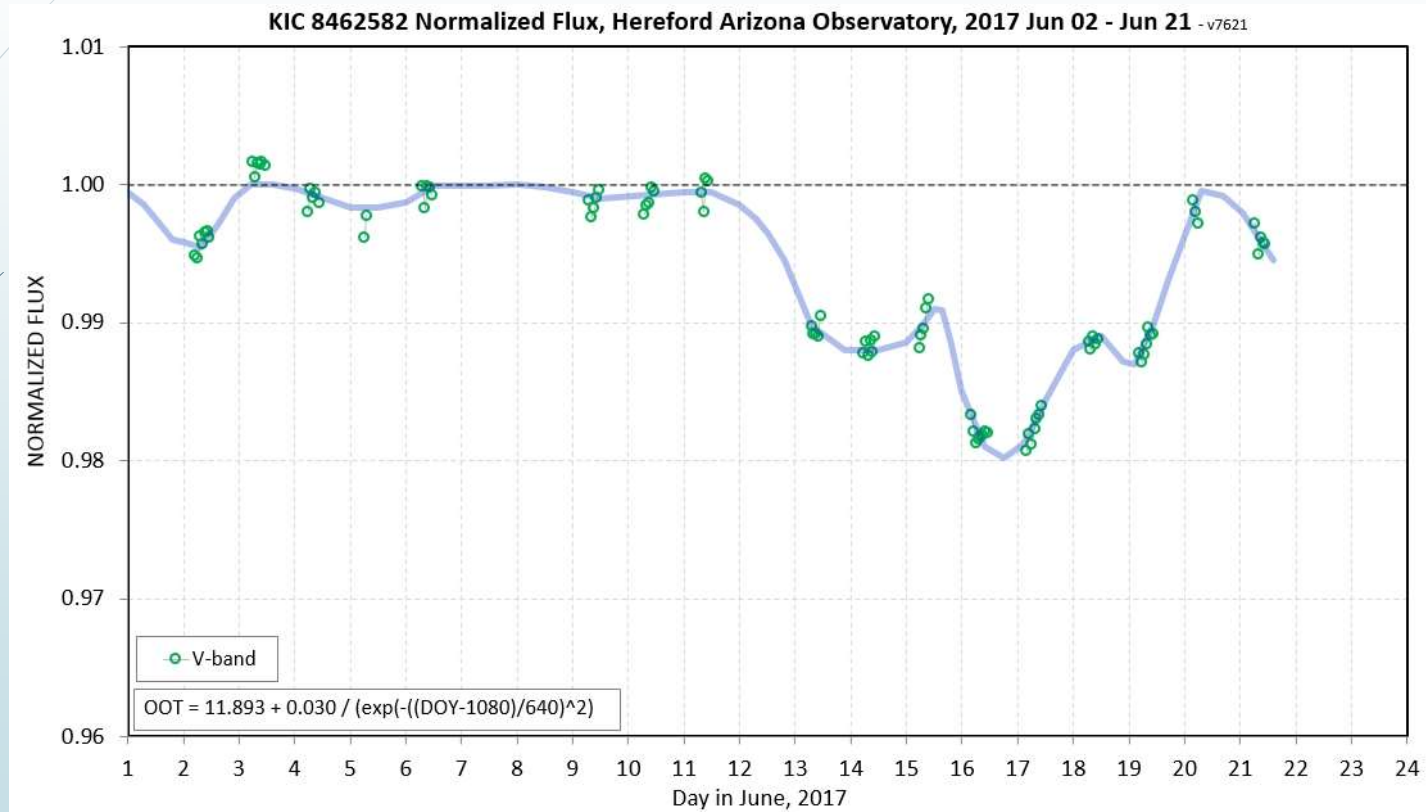
# Limitaciones y Problemas

- Desarrollar modelo analítico que represente las características teóricas para el modelo descrito en la teoría.
- Cantidad de datos.
- Capacidad de mi computadora.



# Kepler Star KIC 8462852 Amateur Photometry Monitoring Project

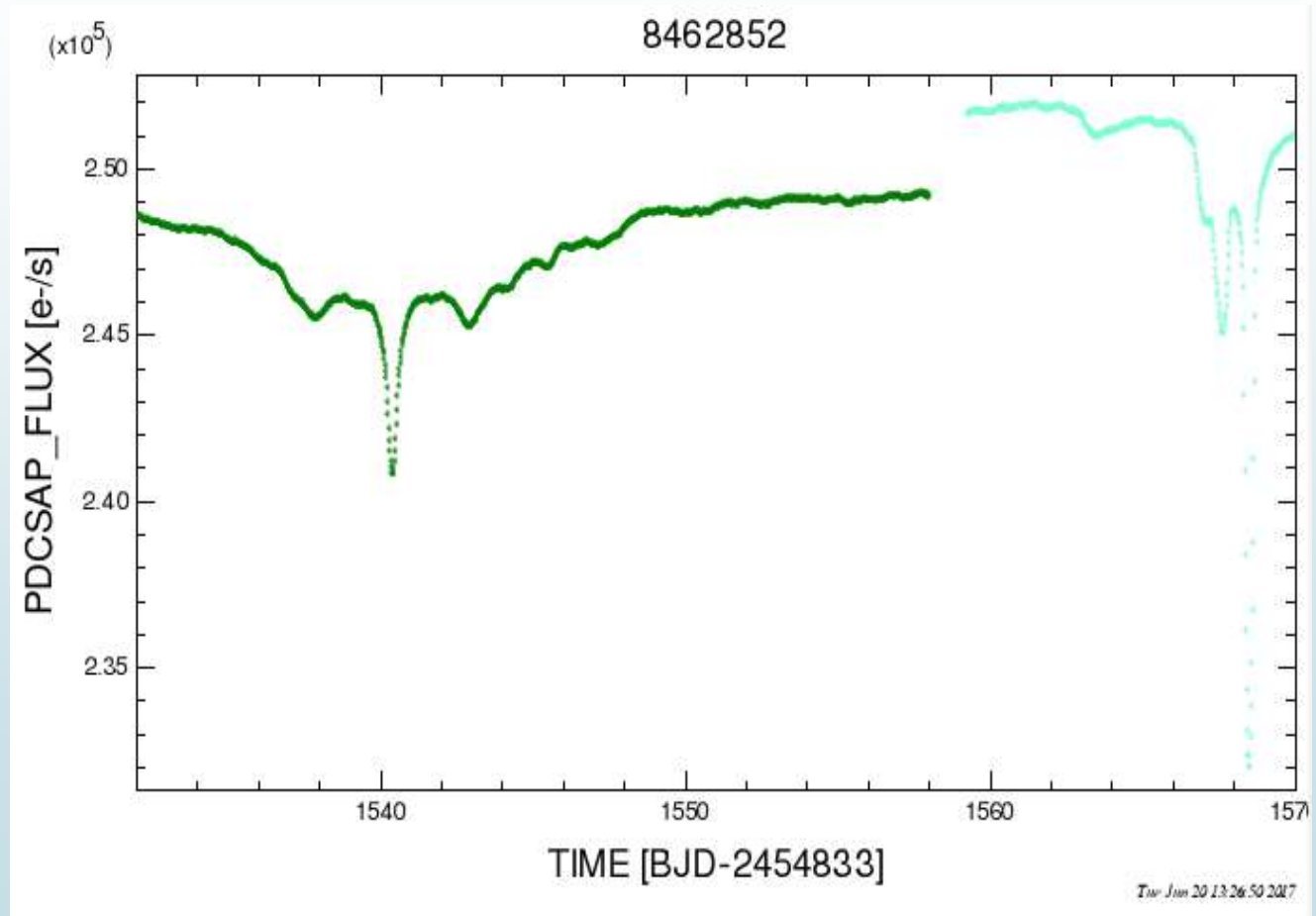
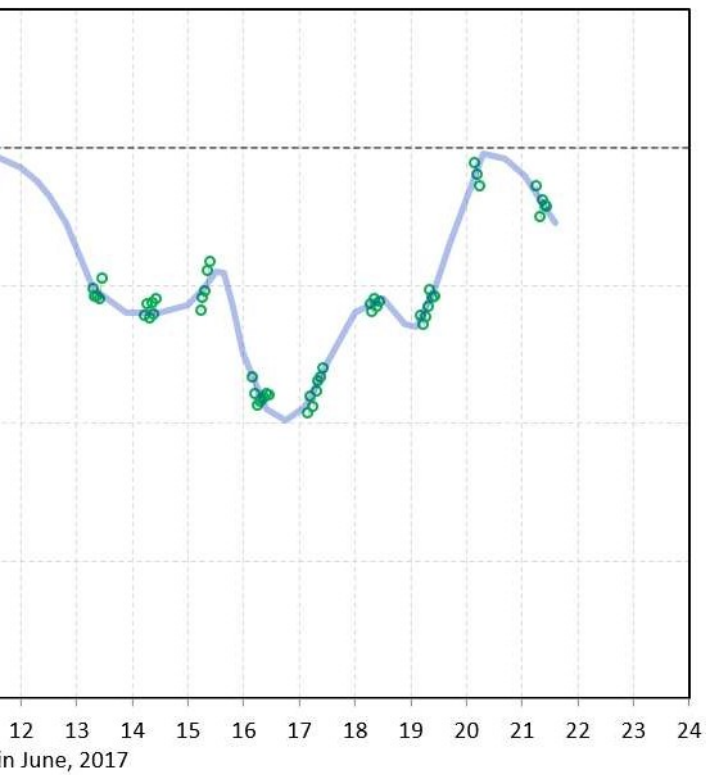
B. L. Gary, last update: 2017.06.22, 06 UT



<http://www.brucegary.net/KIC846/>

# Pan Caliente

Arizona Observatory, 2017 Jun 02 - Jun 21 - v7621





Gracias.