



# Observations of Comet C/2006 P1 McNaught - An Analysis

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# Visual Observation of Comets

- Brightness estimates
  - Derive brightness parameters and define nuclear activity
- Coma morphology
  - Size, shape and condensation, features
- Observations of the tails
  - Types, length, angles to define the dust matrix

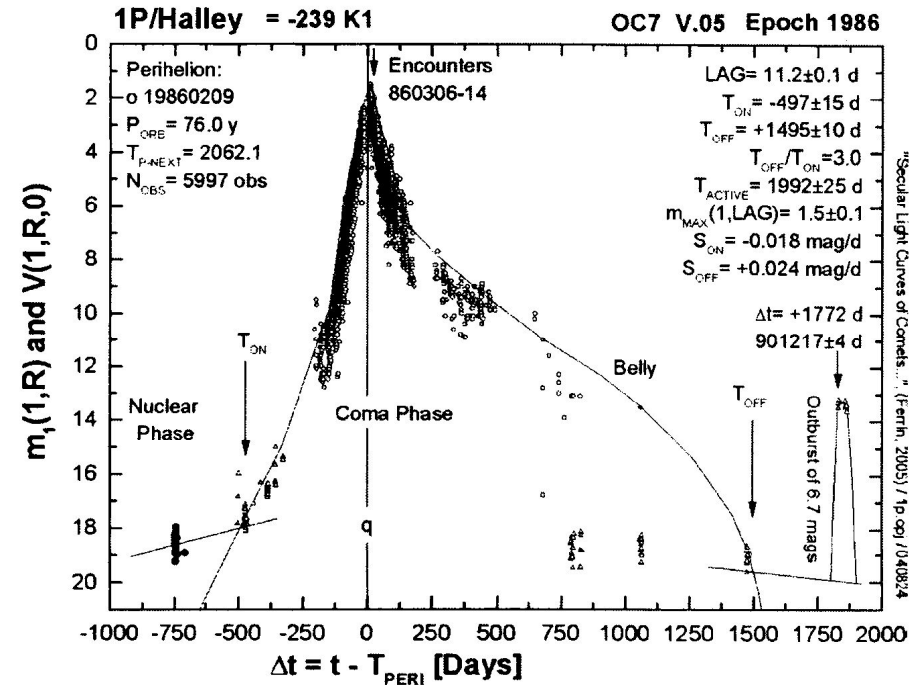
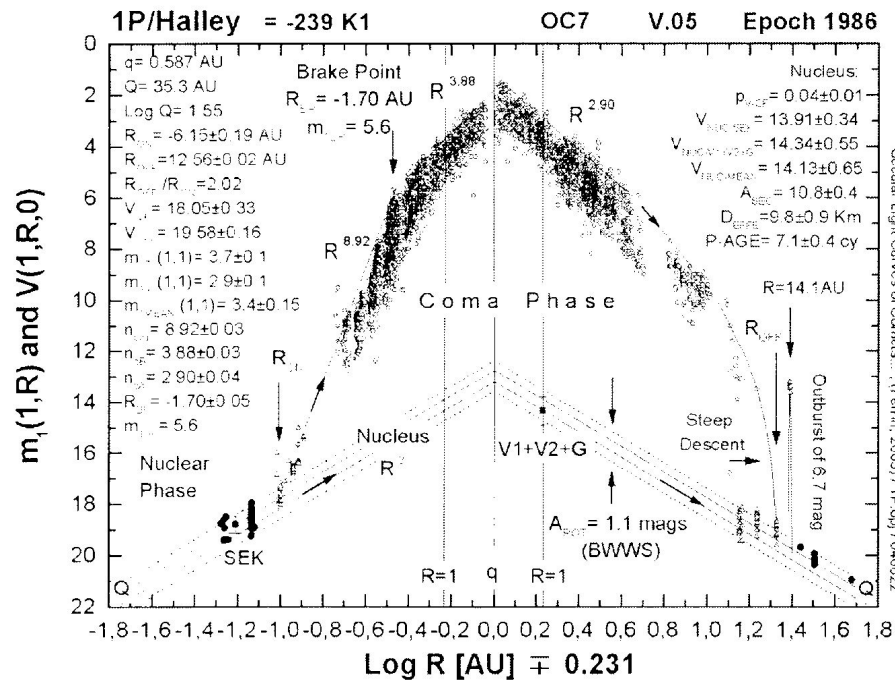
# Derivation of parameters from magnitude estimates

$$m_l = H_0 + 5 \log \Delta + 2.5n \log R + m(\Phi)$$

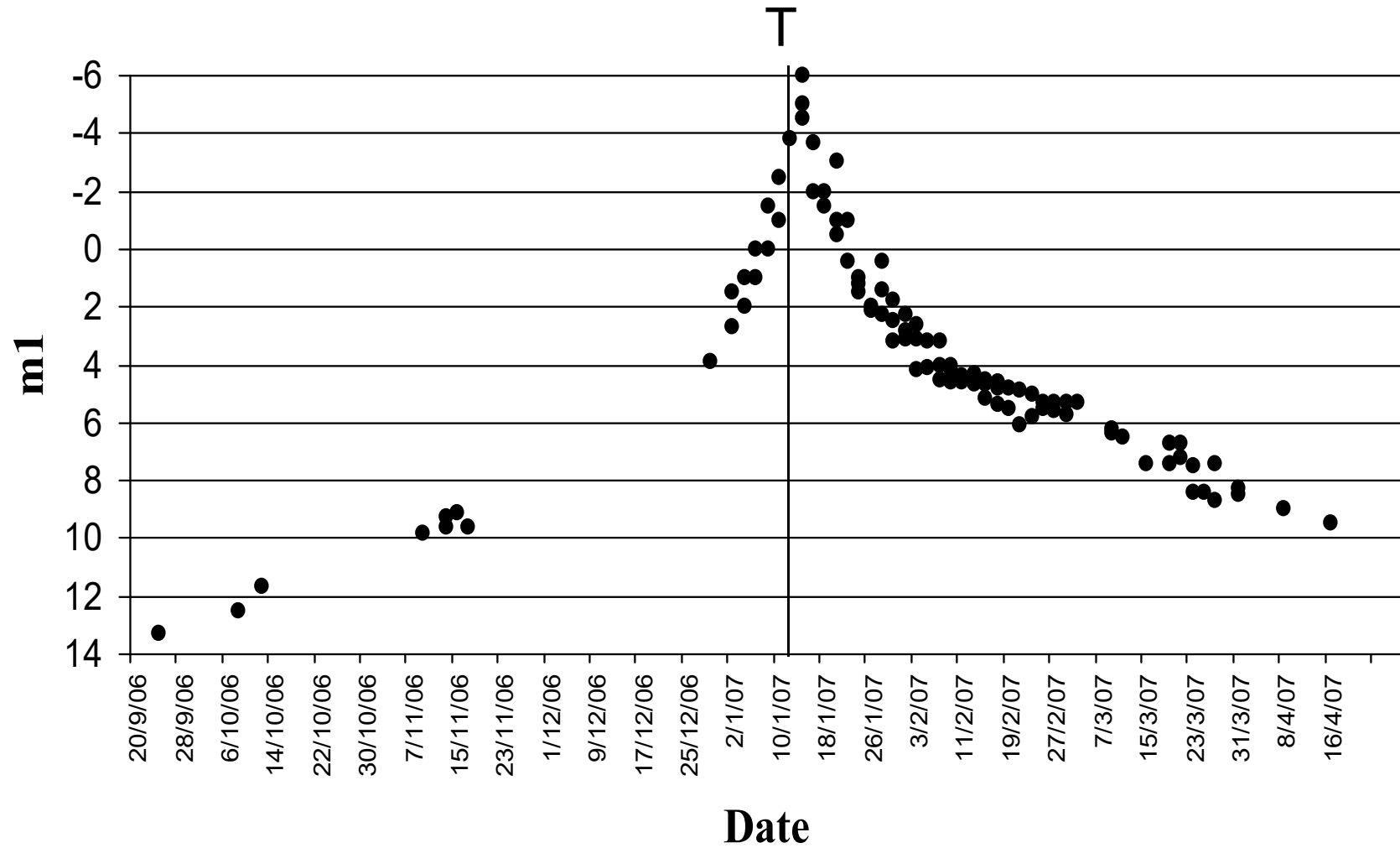
$$\boxed{m_l - 5 \log \Delta} = \boxed{2.5n \log R} + H_0$$

$y = mx + c$

# Derivation of parameters from magnitude estimates



# Light-curve of Comet C/2006 P1 McNaught

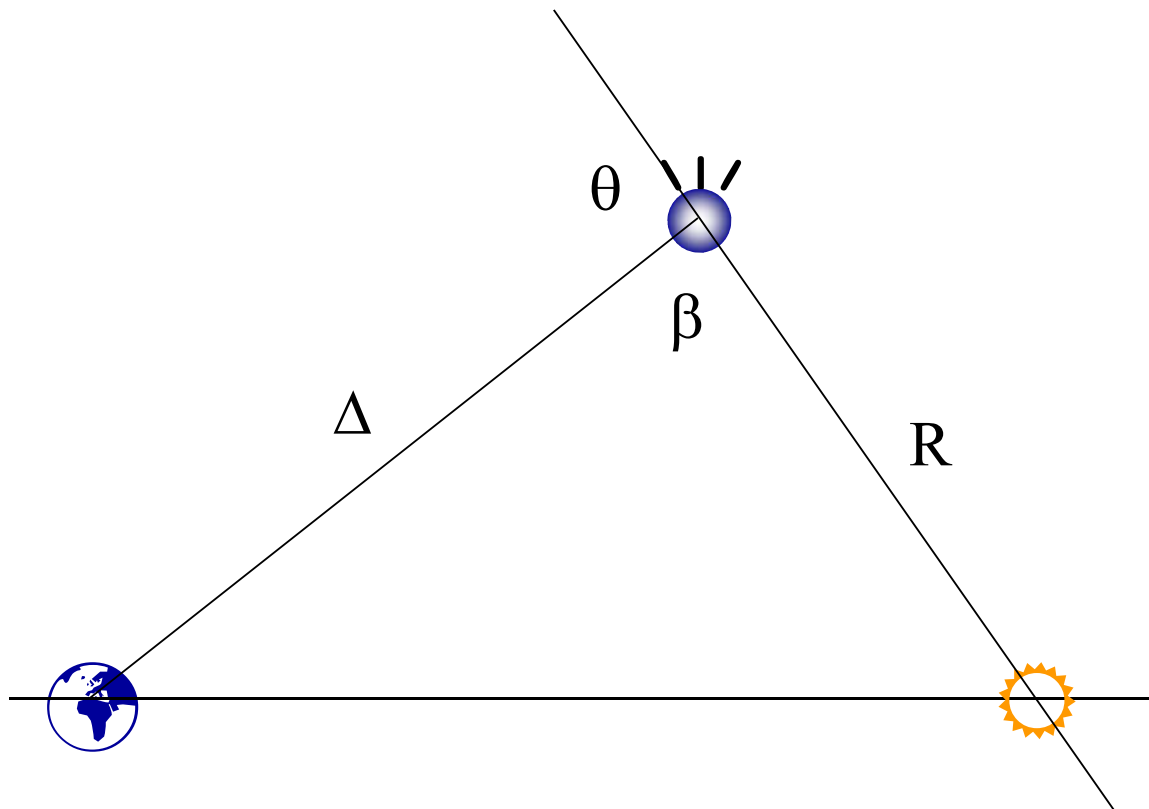


# Brightness behaviour Comet C/2006 P1

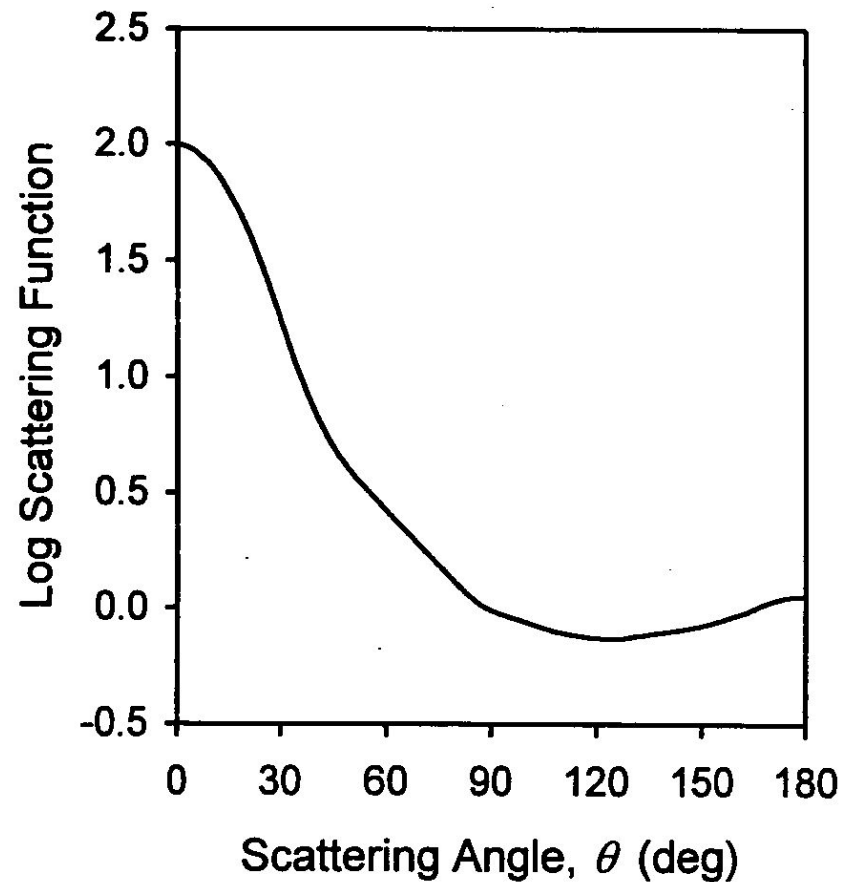
Solid circles pre-perihelion  
Open circles post-perihelion  
Overall  $m_1 = 4.8 + 5 \log \Delta + 2.5(4.4) \log R$

$\beta$  = Phase angle

$\theta$  = Scatter angle =  $180 - \beta$

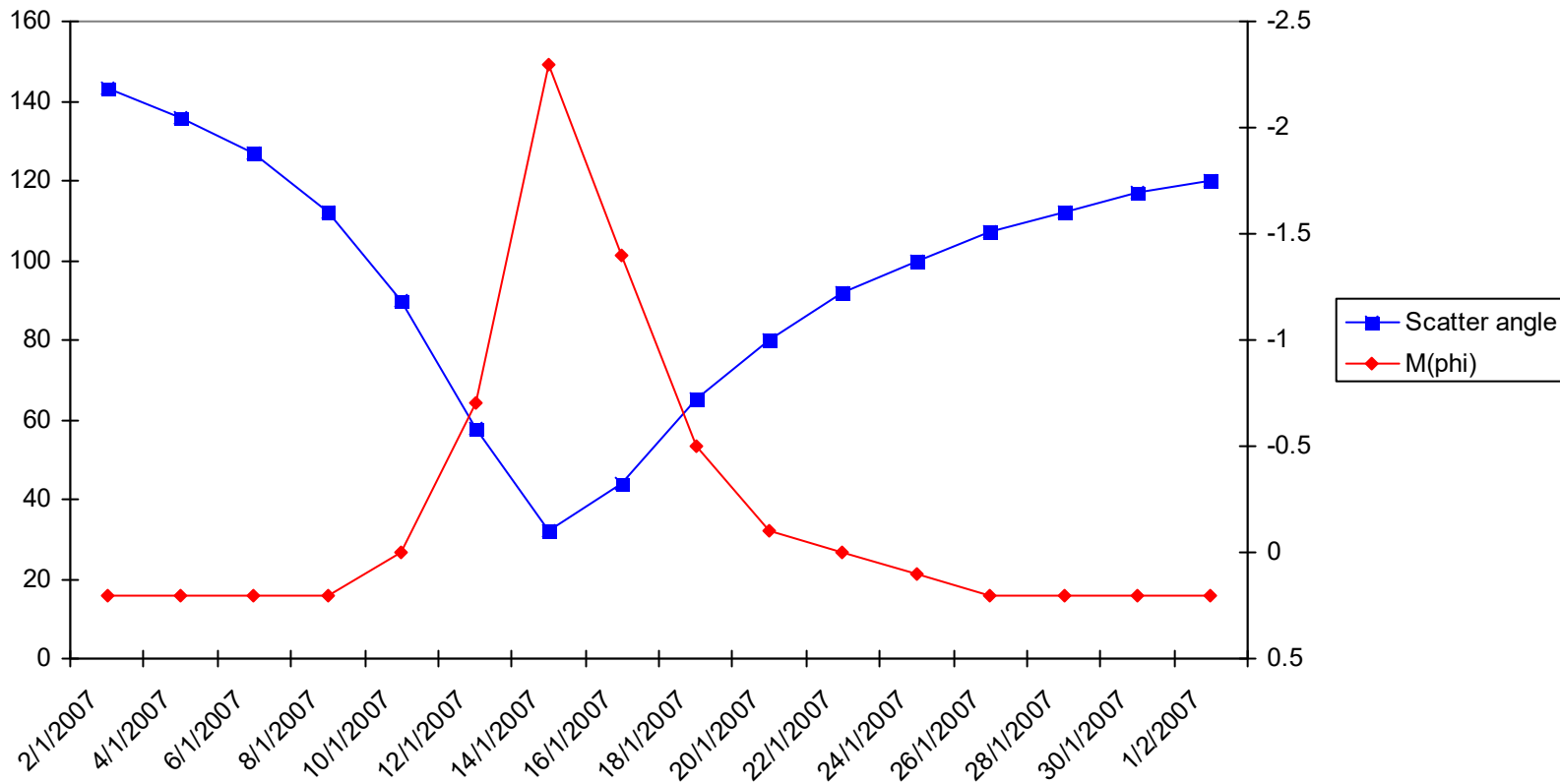


# Scattering of light as a function of scattering angle ( $\theta$ ) for a range of particle sizes





# Predicted brightness enhancement of comet C/2006 P1 versus Scattering angle ( $\theta$ ) after Marcus (2007)



# Summary of brightness parameters

	H0 pre peri	H0 post peri	n pre peri	n post peri
Cooper	5.9	4.2	4.7	4.1
Marcus	5.7	3.8	4.6	3.6

	H0	n
C/1995 O1	-0.5	3.5
C/1996 B2	5.2	3.3
C/1998 J1	6.3	2.4
C/2002 C1	6.5	3.1
C/2001 Q4	5.5	2.2
C/2002 T7	5.6	2.8

# Scale for estimating Degree of Condensation (DC) of comae

1

=



3

=



5

=



6

=

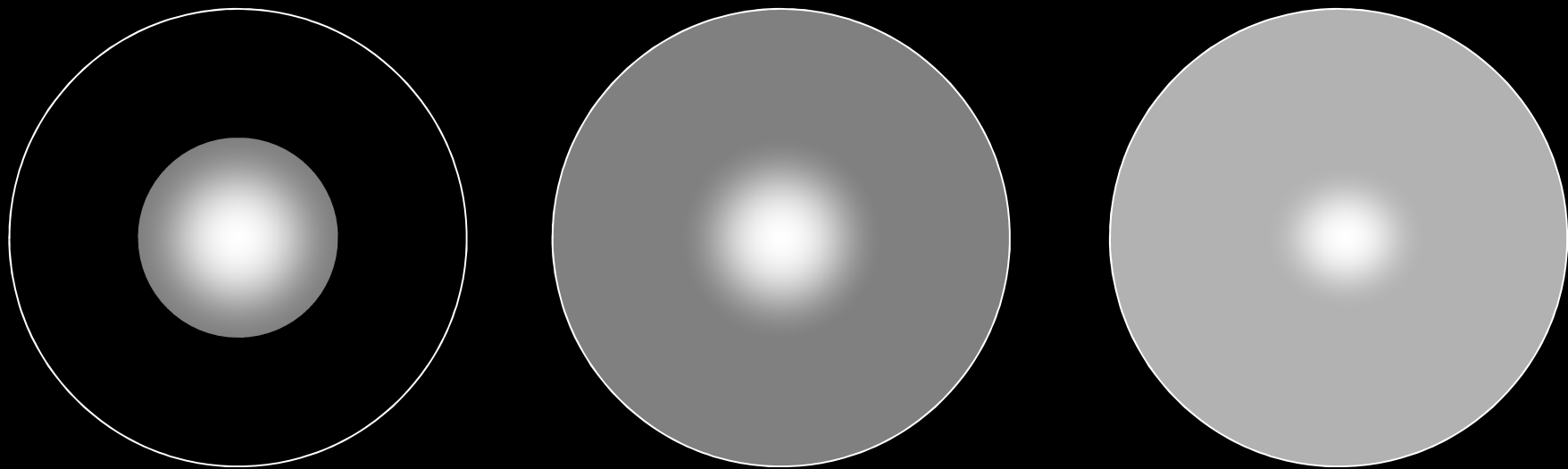


7

=

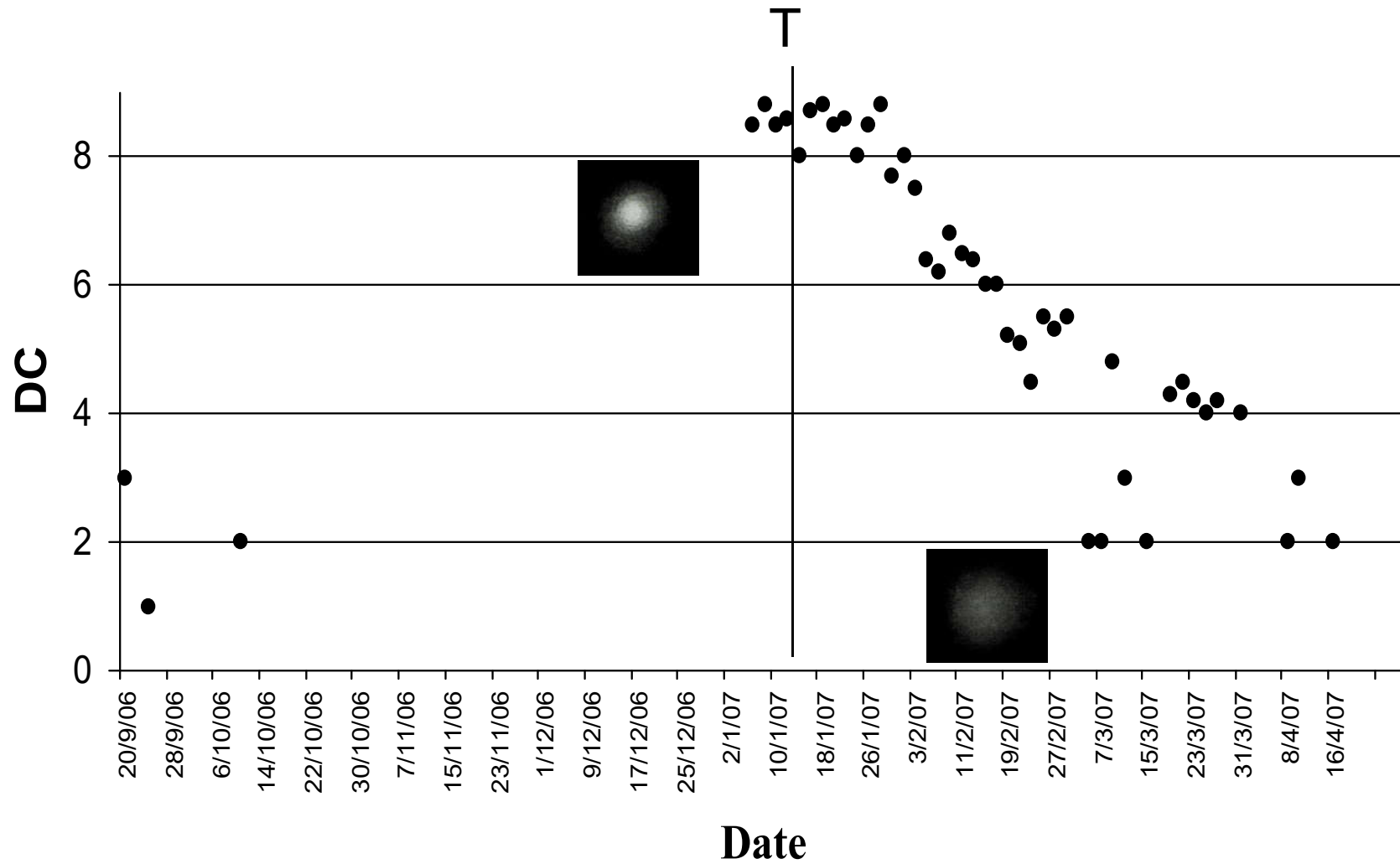


# Effect of sky glare on apparent coma diameter and degree of condensation

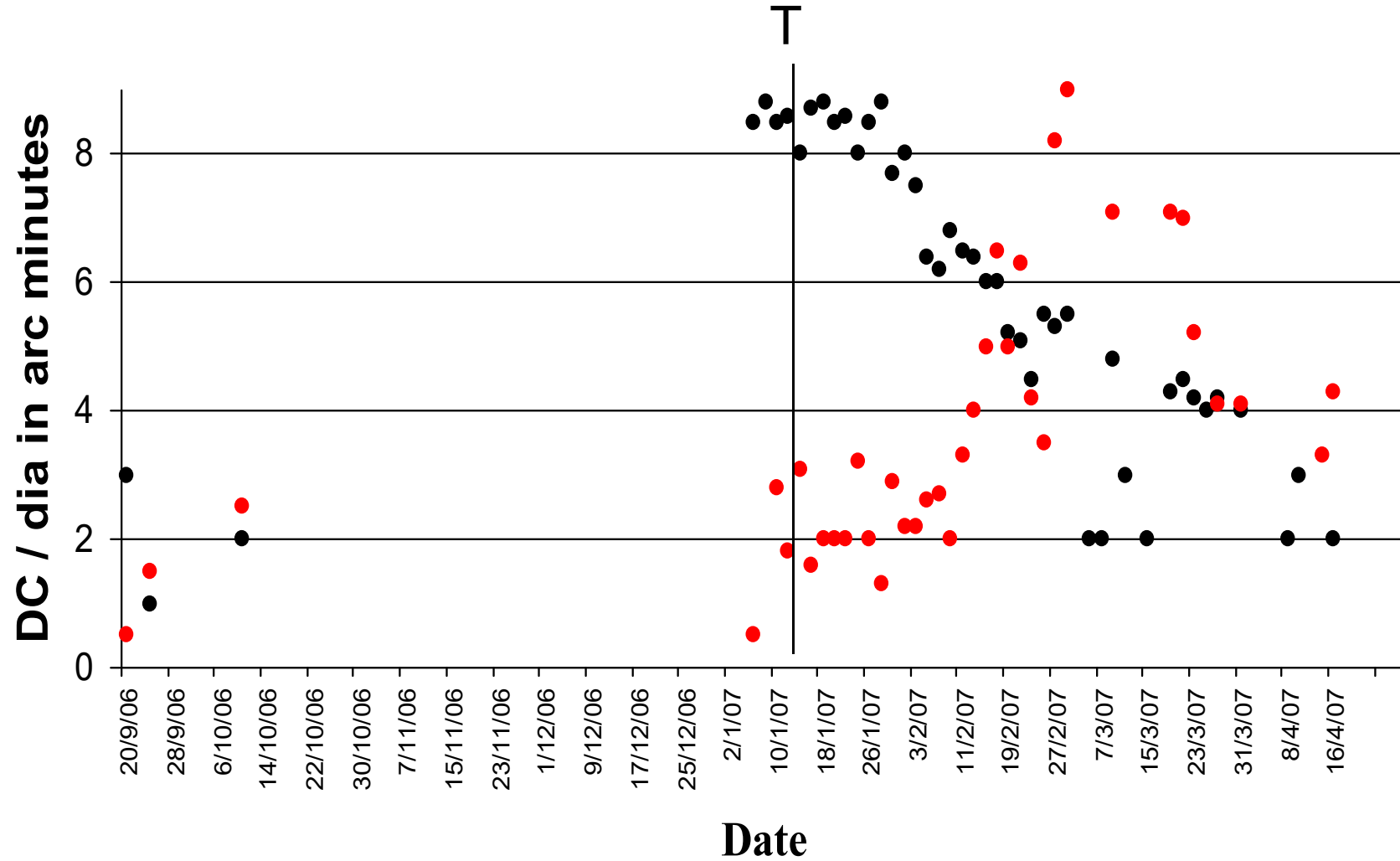


Increasing sky brightness, smaller diameter, higher DC

# Degree of condensation Comet C/2006 P1

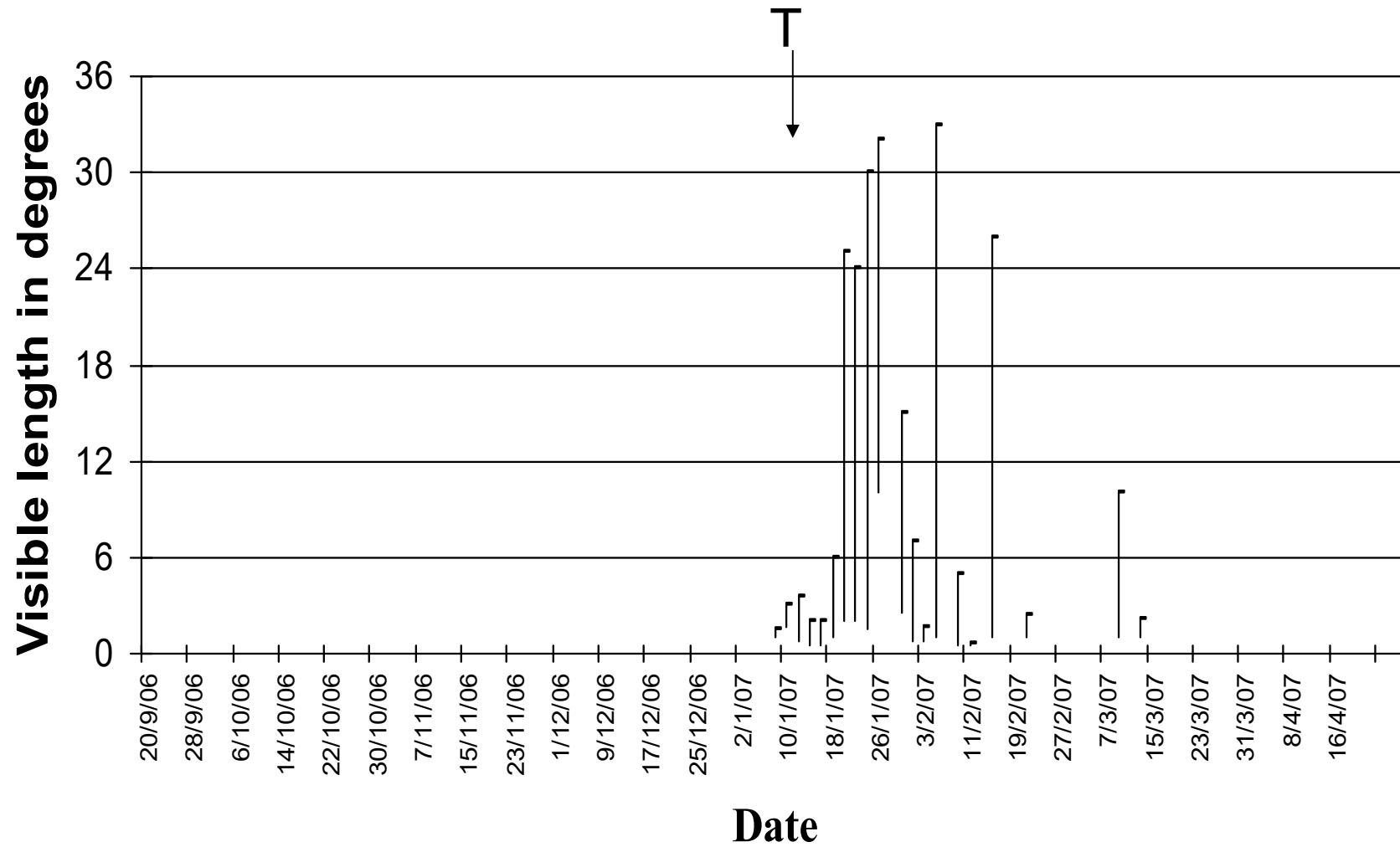


# Degree of condensation and coma diameter Comet C/2006 P1

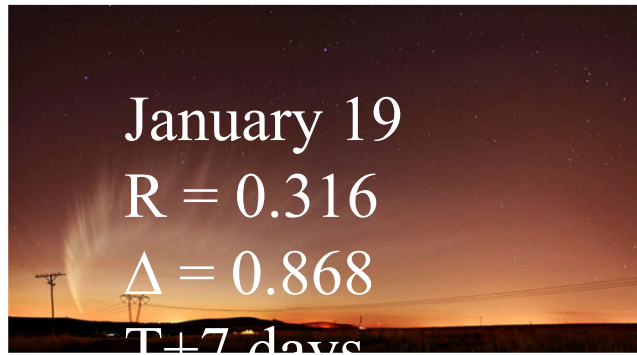


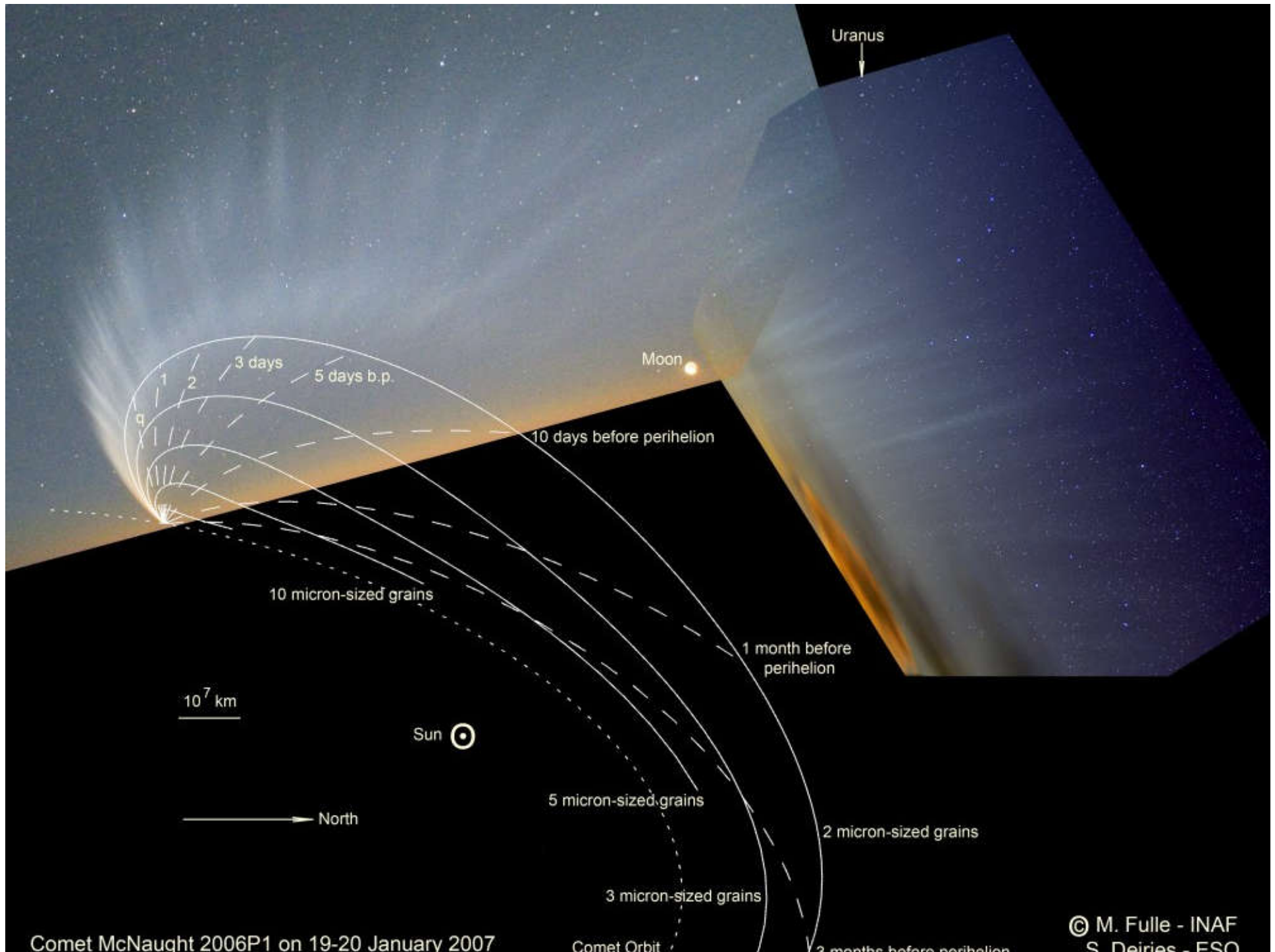
January 15  
T+3 days

# Dust Tail length Comet C/2006 P1

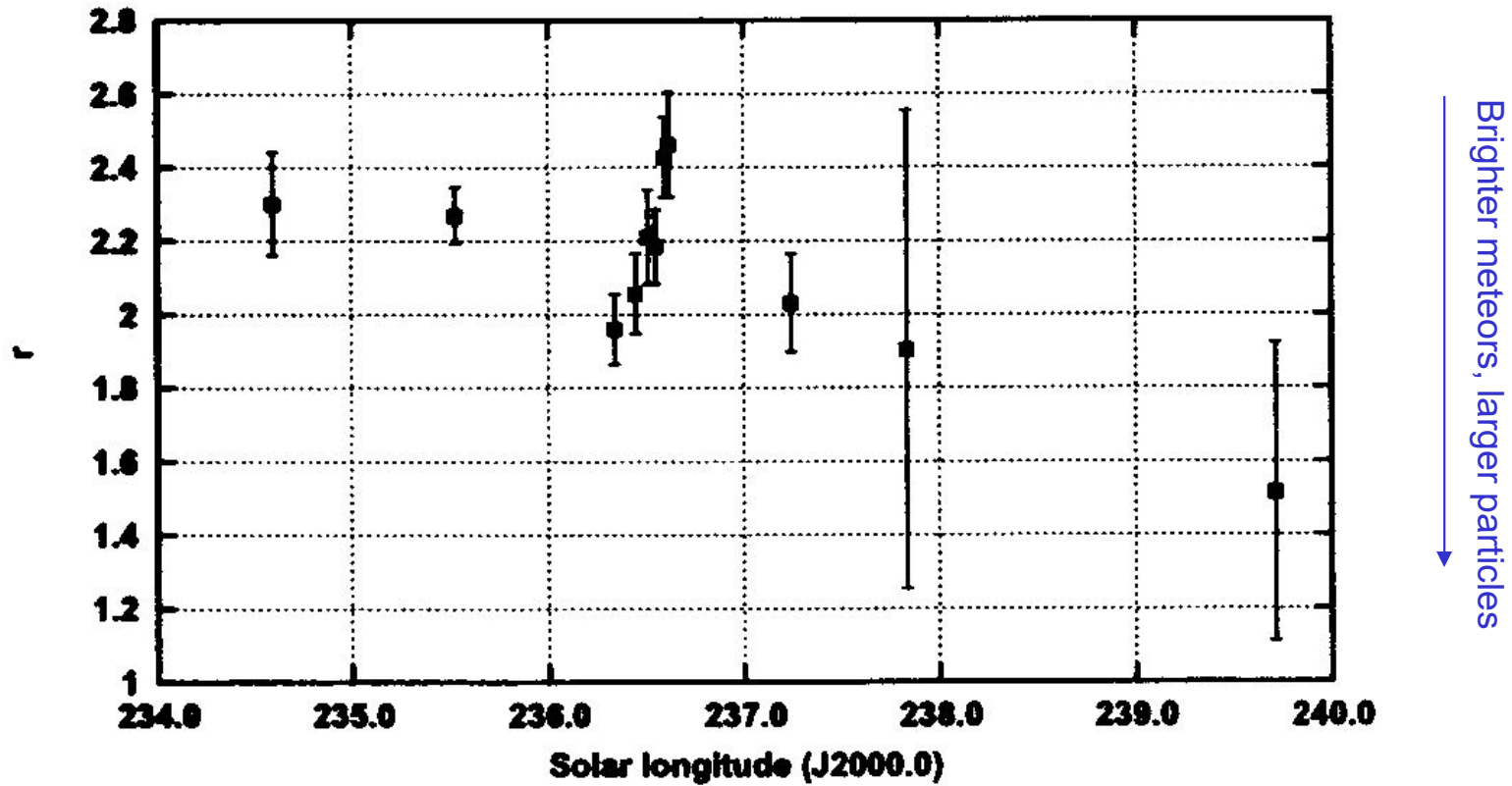




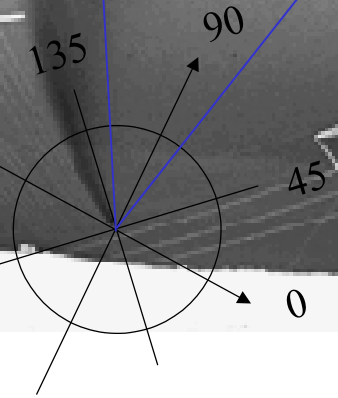
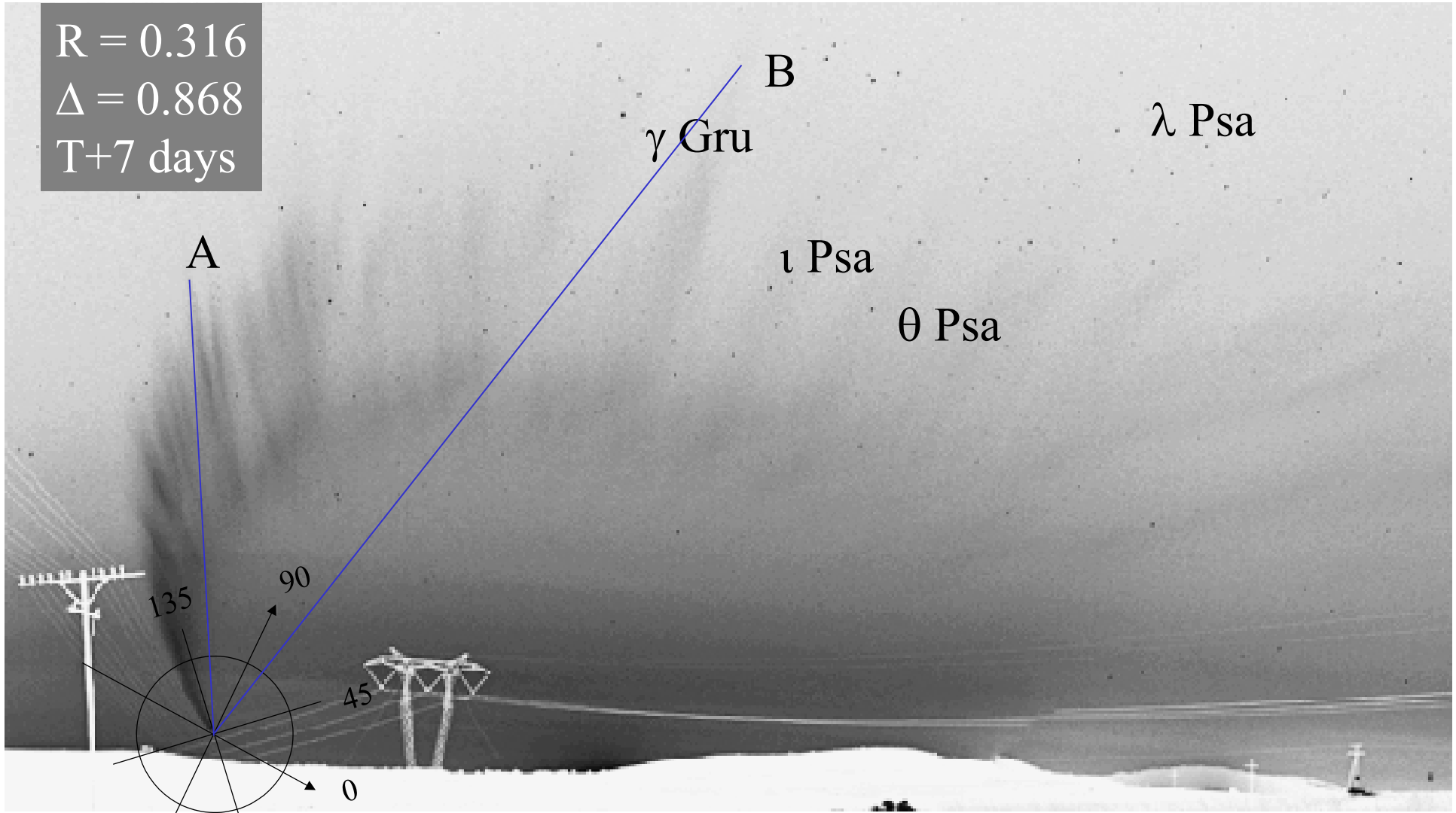




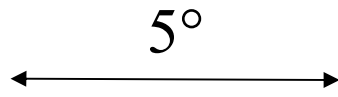
# Population Index 2006 Leonids, parent comet 55P Tempel-Tuttle



$R = 0.316$   
 $\Delta = 0.868$   
T+7 days



Sun



January 23  
T+11 days



February 11



February 20



March 11





April 7



May 20

