

# The Slowly Fading Light Echo Around Type Ia Supernova 2009ig

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Charlotte Wood, Peter Garnavich, Peter Milne, Dina Drozdov  
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Midwest Workshop on Supernovae and Transients - Session 3

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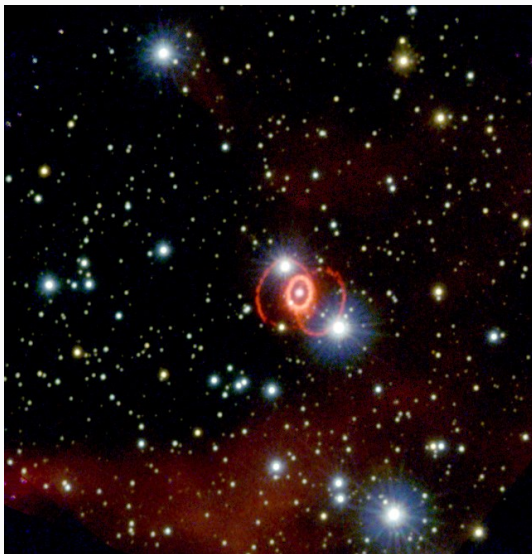
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2. Which Supernovae Have Light Echoes?
3. SN 2009ig Observations & Results
4. What's Next?

# **An Introduction to Light Echoes**

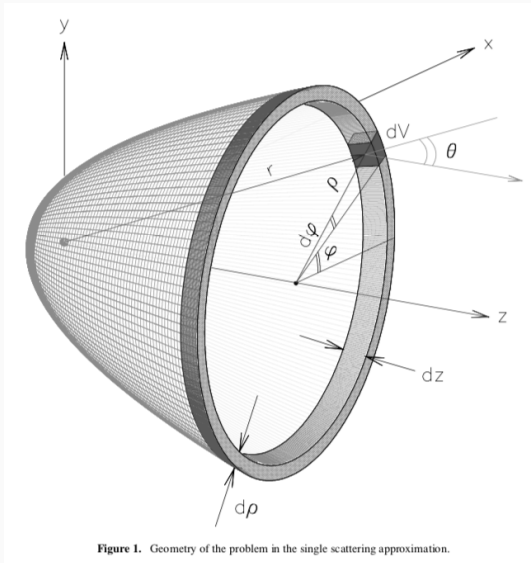
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# What is a light echo?

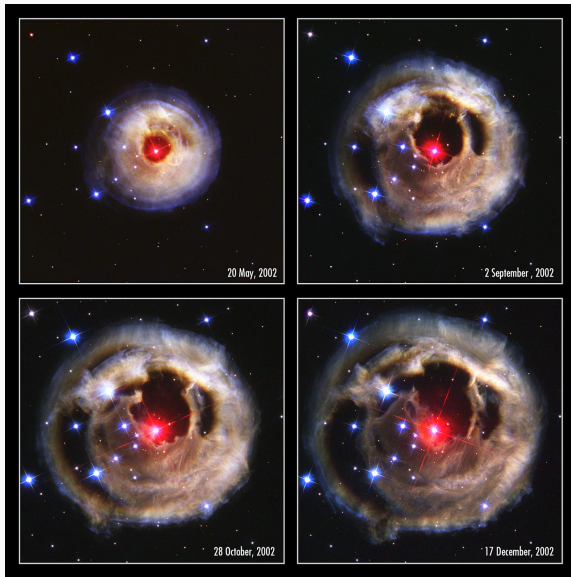
A light echo is the scattering of light by dust into our line of sight



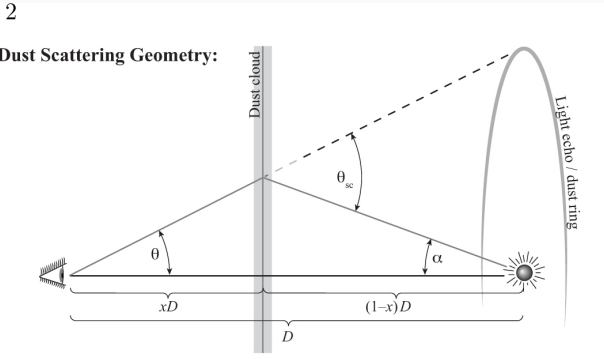
# Geometry of Light Echoes



# Superluminal expansion?

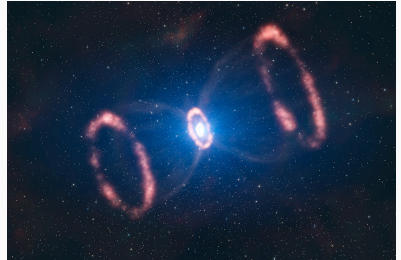
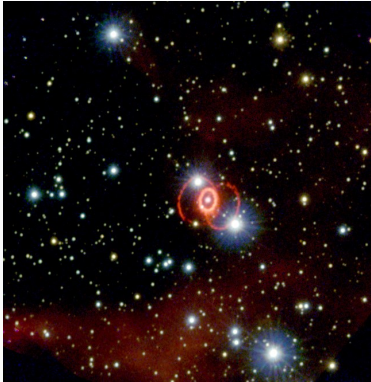


# What can light echoes tell us about supernovae?



- 3-D picture of the local dust distribution
- Distance
- Symmetry of explosion
- Type

# SN 1987A



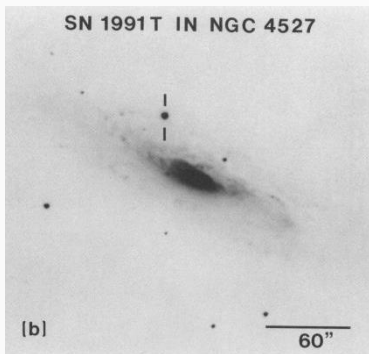


# **Which Supernovae Have Light Echoes?**

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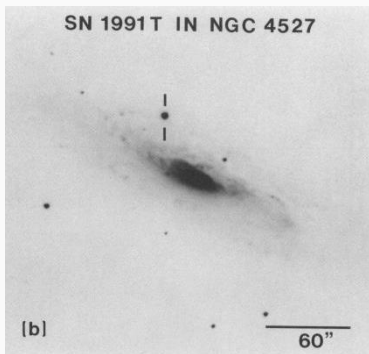
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- Generally found around core-collapse supernovae



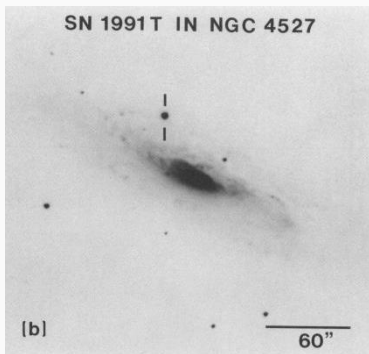
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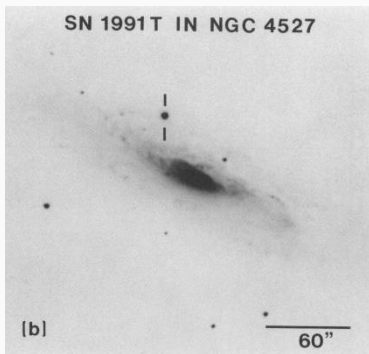
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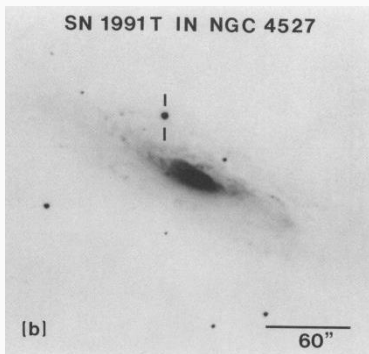
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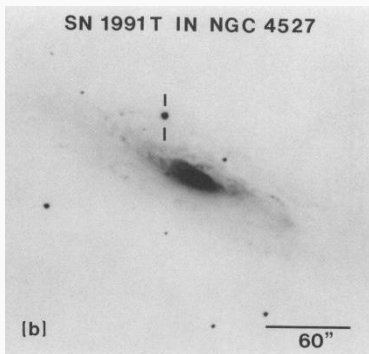
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  - Properties of SNe Ia are related to their environment
  - Affects cosmological parameters
  - Hints at progenitors



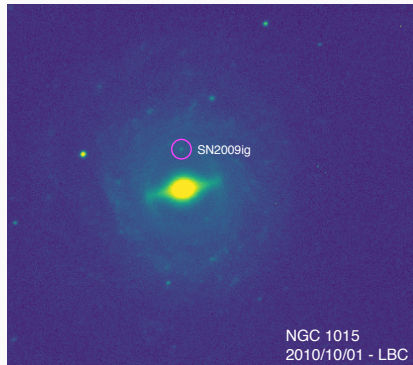
# SN 2009ig Observations & Results

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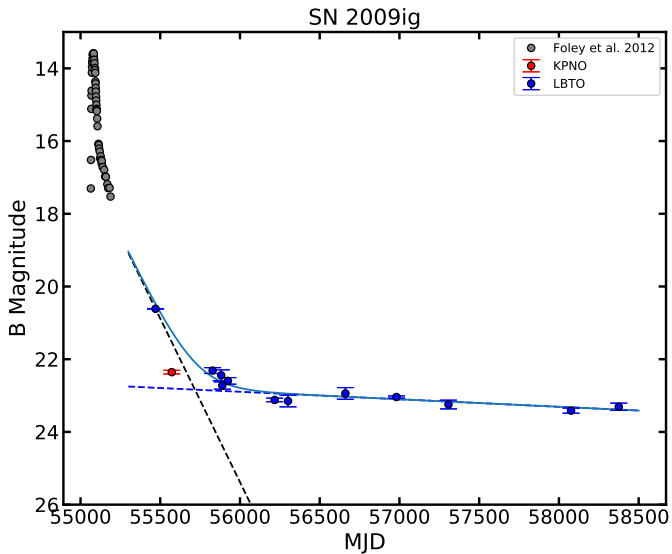


# SN 2009ig Properties

- Located in NGC 1015
- Redshift of 0.0088
- Peak magnitude  $V=13.5$
- Practically no host galaxy extinction ( $A_V = 0.01 \pm 0.01$ )



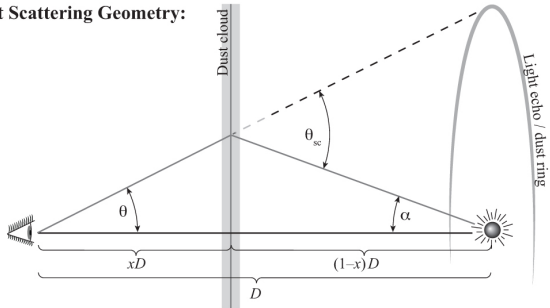
# Late-time Photometry



# Potential geometry?

2

Dust Scattering Geometry:



**What's Next?**

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# Future Work





- Resolved in archival Hubble data?



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- What is the actual geometry?

# Future Work



- Resolved in archival Hubble data?
- What is the actual geometry?
- Proposal to obtain more Hubble data



# Questions?

