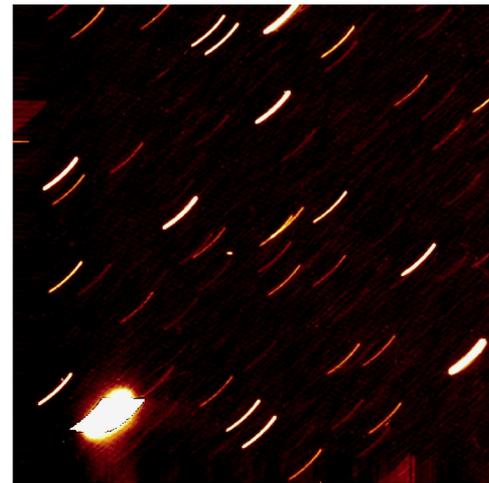
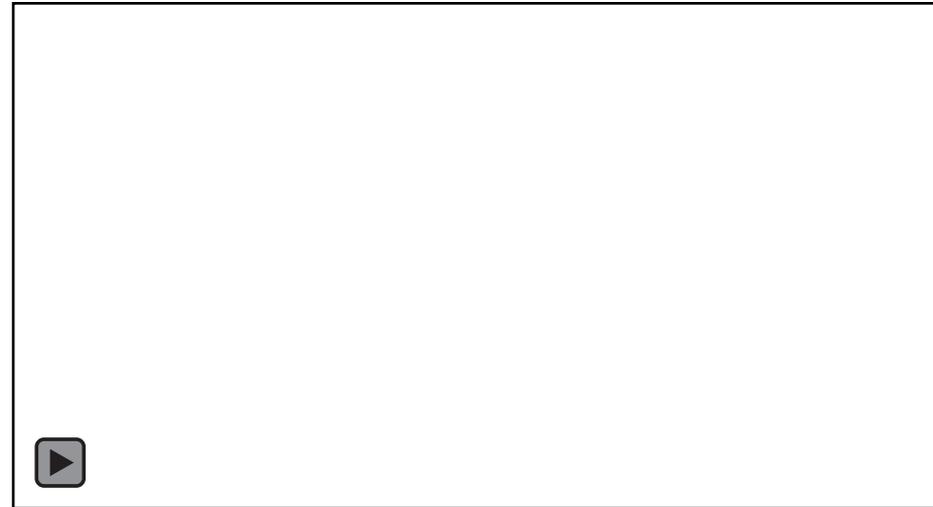


Planetary Defense Exercise

- Second international PD exercise involving a real asteroid
- KW4 campaign built on lessons learned from the TC4 campaign in 2017, but focusing on just physical characterization and risk assessment
- IAWN-led exercise with contributions from outside the official signatories list
 - IAWN Lead: Rob Landis (NASA-JSC)
 - NASA HQ Lead: Mike Kelley
 - Science Lead: Vishnu Reddy
- More than 50 participants from >12 observatories and >9 countries
- Photometry, Polarimetry, Spectroscopy, Radar, Direct Imaging and Impact risk assessment modeling



1999 KW4 through Canada's NEOSat telescope

Data Exchange and Coordination – SBN, UMD

NEA (66391) 1999 KW4 Observing Campaign

Campaign Home page
Current Status
Physical Properties
Observations
Orbit
Observing Geometry
Gallery

RELATED LINKS
Planetary Defense Coordination Office
NASA PDS: Small Bodies Node
Minor Planet Center (MPC)
International Asteroid Warning Network
Center for Near Earth Object Studies

OBSERVING CAMPAIGNS
The Comet Wirtanen Campaign
4*P Coma Morphology Campaign
Comets & Asteroids
Collaborative Astronomy Observers

Introduction

Welcome to the website for the (66391) 1999 KW4 Observing Campaign. Our intention is to provide a central clearinghouse for basic information about the near Earth asteroid (66391) 1999 KW4 and about the observations that will be obtained during its upcoming apparition.

This campaign is organized by the [International Asteroid Warning Network \(IAWN\)](#) to exercise the observing resources and characterization capabilities that may be applied to a near-Earth object on a reasonably short timescale. It is the second such campaign to be organized by IAWN, the first being organized for the [2012 TC4 close approach](#) in October of 2017.

This site will contain background information about (66391) 1999 KW4, a list of observations that are planned/scheduled/obtained, and status reports on the events leading up to the close approach. We will also produce an email list where updates can be broadcast to subscribers.

News

- 2019-06-04: [Bad news: Asteroid 1999 KW4 flew by, did not hit Earth killing us all. Good news: Another one, Dikym99, is on the way](#)
- 2019-06-03: [ESO contributes to protecting Earth from dangerous asteroids](#)

Summary of the 2019 Apparition

NEA (66391) 1999 KW4 is a near-Earth asteroid

- Closest approach to the Earth occurs on 2019-May-25 23:04 UT
 - Speed with respect to Earth is 21.17 km/sec
- Geocentric Distance (current best value - JPL#265)
 - 0.03464 AU
 - 13.5 Lunar distances
 - 5.1800x10⁶ km

Brightness

Current estimates suggest it should peak around mag 12.5 shortly after closest approach

Observing conditions (for observations at visible wavelengths)

Conditions are poor during the asteroid's approach to the Earth, so it may not be highly observable until shortly before the close approach. Conditions improve after close approach, so that is likely when much of the characterization will occur. (See the Observing Geometry link for more details.)

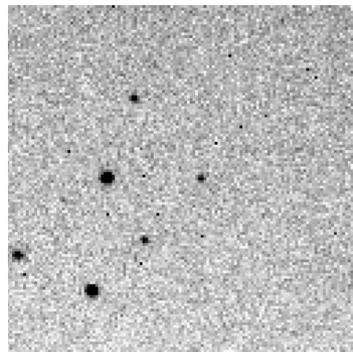
- Before Close Approach**
 - In southern skies (Dec ~-40°)
 - Within 40° of the Sun until late April

- Website provided observing information and campaign observation planning.
 - Included status updates, shape model animations
 - Gallery of observing results
- UMD managed data repository
 - Allowed for immediate sharing of data and analysis results amongst science groups.
 - Notification of which material was for immediate posting.

Courtesy M. Brozovic, JPL

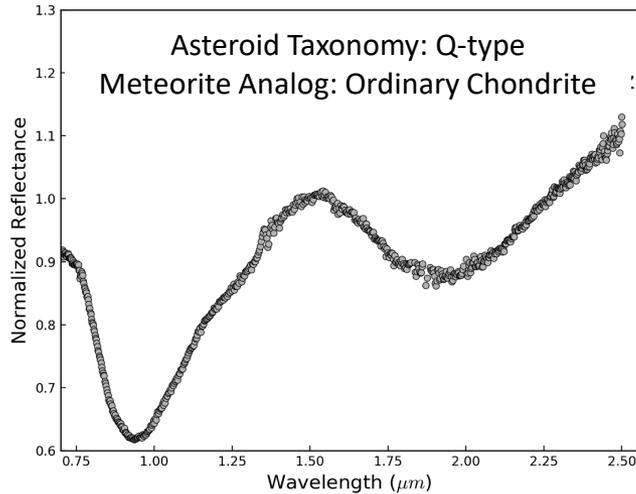


Recovery 2019 May 09.07 UT
Observatoire des Makes, on
Réunion, FR (MPC code 181).



Initial Results

IRTF Spectroscopy



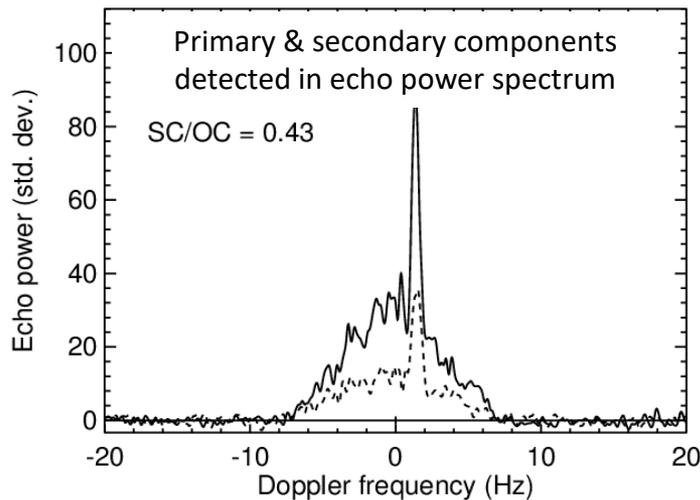
Impact Modeling EXERCISE



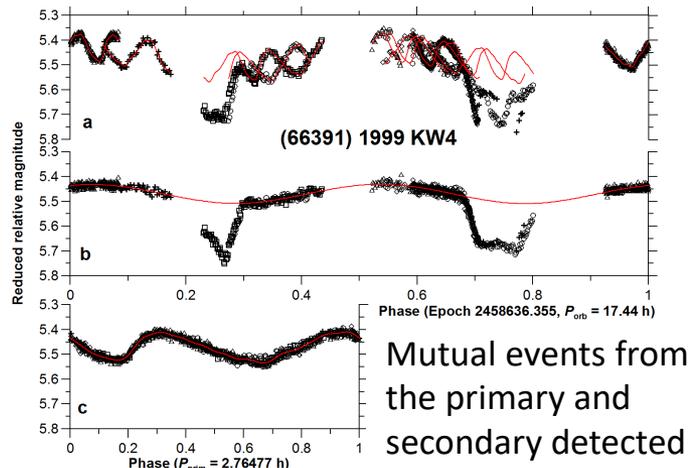
Risk Summary

- Affected pop.: mean 305M, range 650k–1.24B
- Global effects is primary hazard, along with large-scale unsurvivable local blast/thermal damage and substantial tsunami inundation.

Arecibo Radar



Photometry



Mutual events from the primary and secondary detected

Given narrower property distributions, every scenario results in a large number of casualties.