

PLANETARY DEFENSE
INTERAGENCY
TABLETOP EXERCISE 5



FEMA



JOHNS HOPKINS
APPLIED PHYSICS LABORATORY



Lawrence Livermore
National Laboratory

TTX5: Day 1

Objectives, Format, and Scenario

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Welcome to Planetary Defense TTX5

- Welcome
 - From APL
 - From the sponsor



ASSESS

Determine NEO population survey completeness and hazard from NEOs that pose the highest risk

CENTER FOR NEAR-EARTH OBJECT STUDIES (CNEOS)



SEARCH, DETECT & TRACK

Find the natural near-Earth objects – asteroids and comets – and track to determine those whose orbits create an impact hazard to Earth

GROUND & SPACE-BASED OBSERVATORIES,
MINOR PLANET CENTER (MPC),
INTERNATIONAL ASTEROID WARNING NETWORK

PLANETARY DEFENSE

MITIGATE

Demonstrate technologies and techniques to divert or disrupt asteroids in space or inform emergency response activities on the ground

DOUBLE ASTEROID REDIRECTION TEST (DART), FEMA EXERCISES

PLAN & COORDINATE

Work with the U.S. interagency and international collaborations on effective actions for impact threat response

SPACE MISSION PLANNING ADVISORY GROUP,
PLANETARY IMPACT EMERGENCY RESPONSE WG,
PLANETARY DEFENSE IWG

CHARACTERIZE

Determine physical characteristics of NEOs (size, shape, composition, rotation) to understand their natural state

INFRARED TELESCOPE FACILITY,
GOLDSTONE SOLAR SYSTEM RADAR,
NEOWISE



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- A few remarks from certain participants. For example,
 - What is the primary focus of your agency or organization?
 - What role might the agency or office where you have responsibilities play in a planetary defense scenario?
 - What do you aim to take away from this TTX?



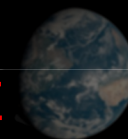
2013/02/15 09:26:23

13 February 2013 near Chelyabinsk, Russia





An Excerpt from Asteroid Hunters





A Series of Planetary Defense Interagency TTXs



2013: TTX1

Acquaint FEMA with the nature of an asteroid impact and how warning of an impact might evolve if the object were detected a short time before possible impact

Time to impact:
1 month

2014: TTX2

Acquaint agencies with the nature and evolution of impending asteroid impact; assess whether and how processes and procedures for disaster warning and response might be employed

Time to impact:
7 years

2016: TTX3

Acquaint disaster response planners with the nature and evolution of information available for, and the inherent challenges of, a potential impact emergency

Time to impact:
4 years

2022: TTX4

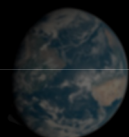
Increase understanding of agencies' roles in mitigating near-Earth object (NEO) impact threats; exercise postimpact protocols, including at the state and local level; test communication methods

Time to impact:
6 months

2024: TTX5

Raise awareness of NEO threats and their challenges; inform preparedness and response capabilities, including international coordination and involvement

Time to impact:
14 years





TTX5 Is Organized Around Four Objectives

Awareness raising



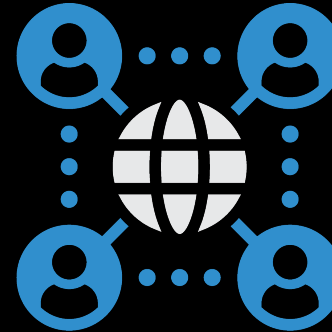
Raise awareness of the nature of asteroid threats and challenges related to preparing an effective international response

Space response



Explore potential in-space responses to an asteroid threat with >10 years of warning time, including international collaboration and contributions

Disaster preparedness



Assess the challenges of and readiness for international emergency preparedness and response to an asteroid impact that would be large enough to devastate entire regions

Information sharing & public messaging



Identify current mechanisms for and barriers to international asteroid threat-related information sharing and communications, including public messaging strategies



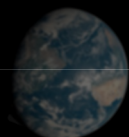
Structure of the TTX

TTX will explore a single moment in time through the lenses of three themes:



Module	Description
1	Scene setting and initial international coordination
2	Space mission options
3a	Recommended courses of action
3b	Senior leader briefing
4	Public information messaging
5	Disaster preparedness

- Day 1: Modules 1, 2, and 3a
- Day 2: Modules 3b, 4, and 5
- Participants will discuss potential courses of action (COAs) and aim for consensus on Day 1 to share with senior leadership on Day 2





Intent of This TTX

- Generate dialogue about issues that pertain to preparedness for and response to a potential asteroid impact
- Accept the scenario at face value and address the events as they unfold
- Engage in an interactive discussion about different organizations' and governments' policies, procedures, and potential responses
- Learn from each other and enhance cross-agency and international communications and coordination

All participants are encouraged to contribute in this *no-fault* environment.

Views *are not* expected to be official government or organizational positions.

Varying viewpoints, contrary opinions, and/or disagreements are welcome.



What to Expect: Data Collection

- Data collectors in the room will take notes on discussions.
- Players will share thoughts via participant feedback forms.
- Facilitators will lead hot washes to get lessons learned, best practices from players.
- There will be no media in the TTX room; comments in the final report will be anonymized.



TTX4 AAR helped define
future investments

Your comments, discussions, and written responses are the data that will help this TTX culminate in an impactful after-action report.



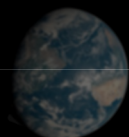
High-Level Agenda

Day 1 (April 2): 8 a.m. – 5 p.m.

- 7:30 a.m. Arrival, check-in
- 8:00 a.m. Welcome, introductions, logistics, etc.
- 9:00 a.m. Module 1: Scene setting and initial international coordination
- 9:45 a.m. Break
- 10:00 a.m. Module 1 (cont.)
- 11:10 a.m. Module 2: Space mission options
- 12:00 p.m. Lunch
- 1:00 p.m. Module 2 (cont.)
- 2:10 p.m. Module 3a: Courses of action
- 3:00 p.m. Break
- 3:15 p.m. Module 3a (cont.)
- 4:30 p.m. Day 1 hotwash
- 5:15 p.m. Planetary defense social hour

Day 2 (April 3): 8 a.m. – 4 p.m.

- 7:30 a.m. Arrival, check-in
- 8:00 a.m. Welcome
- 8:30 a.m. Module 3b: Senior leader brief
- 10:15 a.m. Break
- 10:30 a.m. Module 4: Public information messaging
- 12:15 p.m. Lunch
- 1:15 p.m. Module 5: Disaster preparedness
- 3:15 p.m. Break
- 3:30 p.m. TTX debrief, capability gaps, next steps
- 4:00 p.m. Adjourn



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Zoom, XLeap, and Qualtrics “How to” and Login

Online Protocols

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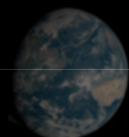


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Zoom Login and Online Protocols

- Zoom links will be provided for all remote participants and observers.
- Groups of participants/players may be muted at designated times to limit unintentional noise during the discussions, but players will have the ability to unmute their microphones to speak during the event.
- We ask that participants/players chat and offer comments through the XLeap application.
 - Please avoid using Zoom chat. While Zoom chat will remain open during the event, it will only be monitored to address logistical and administrative questions.
- Each slide within the XLeap application will correspond to its own chat thread. However, if you are engaged in a smaller conversation on a specific topic and the team has moved on to the next slide, you may continue the conversation in two ways:
 1. Accessing the XLeap “main” chat room to carry on the discussion; and/or
 2. Scrolling back to the prior slide(s)





XLeap and Qualtrics Tour

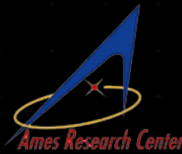


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