

## **WORKING GROUP**

**CHAIR**  
**VICE-CHAIR**  
**PAST CHAIR**

## **NEAR-EARTH OBJECTS**

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**Alan W. Harris**  
**Giovanni Valsecchi**  
**David Morrison**

## **TRIENNIAL REPORT 2009-2012**

### **1. Introduction**

Following its meeting in May, 2010, the IAU Executive Committee requested that a Working Group on NEOs within Div. III be re-activated and carry out the following activities:

- a) investigate and formulate requirements for an international ground- and/or space-based NEO survey, to detect, track and characterize (optical/IR, radar) 90% of all NEOs with  $D > 40$  m and to establish as such a permanent International NEO Early Warning System; to submit to the President, Vice-President and OC of Division III by March 31, 2011, a progress report and by March 31, 2012, a final report on this matter, to be forwarded to the President and General Secretary of the IAU;
- b) assemble a SOC in order to write and submit to the IAU Assistant General Secretary before December 1, 2010, a proposal for a GA IAU Symposium or a GA Special Session, to be held during the IAU XXVIII General Assembly, August 20-31, 2012 in Beijing, on theoretical and observational aspects of NEO research in general, and on requirements and other aspects of a permanent International NEO Early Warning System in particular;
- c) prepare and submit to the IAU General Secretary by January 31, 2012, a Resolution for consideration by the IAU XXVIII General Assembly in Beijing, August 2012, asking for international action and support to establish an International NEO Early Warning System; such a Resolution, if accepted by the IAU XXVIII General Assembly, to be addressed to the IAU National Members, to the United Nations Committee on the Peaceful Uses of Outer Space (UN-COPUOS), and to the International Council for Science (ICSU).

### **2. New Working Group**

Karen Meech, President of Division III, with advice from a number of IAU members active in NEO studies, appointed the following members of the new WG:

PRESIDENT Alan W. Harris  
 VICE-PRESIDENT Giovanni Valsecchi  
 PAST PRESIDENT David Morrison

Abell, Paul	USA	Consultant, human exploration
Beshore, Edward	USA	PI, Catalina Sky Survey (CSS)
*Chesley, Steve	USA	VP, C20
*Harris, Alan W.	USA	NEOWG Chair
*Harris, Alan W.	Germany	NEOMAP ESA
*Huebner, Walter	USA	
*Jedicke, Robert	USA	
Jones, Lynne	USA	Consultant, LSST
*Koschny, Detlef	Netherlands	ESA NEOs
*Larson, Steve	USA	CSS
*Mainzer, Amy	USA	Consultant, WISE NEO
*McMillan, Robert	USA	PI, Spacewatch
Meech, Karen	USA	Pres. Div III
*Milani, Andrea	Italy	
*Morrison, David	USA	NEOWG Past Chair
*Rickman, Hans	Sweden	
Sanchez, Salvador	Spain	Consultant
*Shustov, Boris	Russia	Chair NEO hazards, RAS
Spahr, Tim	USA	Director, Minor Planet Center
*Valsecchi, Giovanni	Italy	VP Div III, NEOWG Vice Chair
*Yoshikawa, Makoto	Japan	Pres. C20
Zhu, Jin	China	C20 OC
*Member of SpS SOC (see (b) below).		

### 3. Progress

Some progress has been made on the above action items, which I describe as follows.

a) On the face of it, a “survey, to detect, track and characterize (optical/IR, radar) 90% of all NEOs with  $D > 40$  m” appears to be beyond reasonable or cost-effective capability from either ground or space. Expert studies done by the U.S. National Research Council and NASA instead recommend a combination of cataloging most (90%) of objects  $> 140$  m diameter, so that an impact from such an object could be predicted years or decades in advance, and mitigation measures considered. For smaller objects, down to 40 m or so in diameter, early warning surveys that could provide days or weeks warning in time for civil defense measures seem more appropriate. The WG would welcome further advice from the EC before undertaking further study or preparing a final report in 2012.

b) Upon consultation among the members of the WG, it was decided that a GA Special Session would be more appropriate than a full IAU Symposium. The SOC was composed as indicated (\*) from the above list of WG members. Co-Chairs of the SOC are Valsecchi, Huebner, and Harris (USA). Editors of a proceedings were chosen: Milani, Harris (USA), Huebner, and Rickman. The proposal was accepted by the EC in its meeting in Prague in May, 2011. We record in this report the abstract of the proposal as accepted:

*The Spaceguard Report, published in 1992, advocated discovery of 90% of Near-Earth Objects larger than 1 km in diameter. That goal has been essentially achieved, and a new goal has been proposed to reach 90% completion to a size of 140 m diameter. As we turn attention to smaller size NEOs, better and larger telescopic systems are required, data*

*storage and processing becomes more complicated both by the sheer numbers of objects but also the increased role of non-gravitational (radiation) forces on the objects, and appropriate mitigation responses are different for small (but potentially more frequent, and with less warning) impact events. Thus we propose a Special Session of 1-2 days duration to assess what has been achieved to date, and evaluate future plans for surveys, required physical observations, and mitigation scenarios.*

We suggest that since the subjects to be addressed in the SpS bear directly on matters to be addressed in charge (a), perhaps a final report on those matters should be postponed until after the SpS.

c) The WG has not yet taken any action on the third item, due January, 2012.

Alan W. Harris  
*Chair of WG*