



March 28, 2023

Dear IAWN Steering Committee,

As the founder and operator of the Mind's Eye Observatory, I would like to request membership and participation in the International Asteroid Warning Network (IAWN). Mind's Eye Observatory (MEO) was constructed in 2019 and has been participating in science almost from its inception. It is sited just off the Saint Sebastian Preserve in Vero Beach, Florida U.S.A., affording it dark skies. While sky transparency can suffer, seeing conditions can be very good due to our southerly location. MEO utilizes two main instruments at this time, a highly modified Schmidt Cassegrain .3 meter telescope operating at F3.3 and a wide field Schmidt Cassegrain .2 meter operating at prime focus F1.9. Both use very high Q.E. CMOS cameras.

In June of 2022 MEO was granted IAU observatory code W42 and has been conducting observations and astrometry on Near Earth Objects (NEO's). I have been concentrating on followup observations for objects in need of orbit improvement and new object confirmations (NEOCP's).

In 2020 MEO participated in research for satellite positional awareness with Ph.D students at Embry Riddle Aeronautical University Daytona, Florida, concluding in an AAS paper 20-679. An important aspect in this research was the use of affordable off the shelf equipment in interesting new ways for better results. This relationship continues and has garnered my interest towards more partnerships and outreach with schools and students. I hope to continue MEO's minor planet programs with their involvement.

MEO also conducts timing occultations, supernova imaging-photometry and deep sky imaging. I continue to refine my techniques and learn new ones so MEO's observations are scientifically rigorous of which good data can be extracted.



I also continue to make equipment improvements and modifications for the best results possible while thinking outside of the box. Future projects at MEO include increasing computational power, synthetic tracking software and operating a second astronomical imaging system (AIS).

MEO has communications with other observatories performing the same research and can consult with astronomers that have successful minor planet programs. One such astronomer I consult with is Ron Dyvig at the Badlands Observatory (IAU 918) in Quinn, South Dakota U.S.A.

Personally, I have 30 years experience in astronomy with my education in the field mostly self-tuition. My interest in becoming a member is to contribute in the effort to characterize NEO threats, participate in campaigns and share data with other researchers. Participation in communicating that research is an interest as well. Many recent NEO events and close approaches in the media have shown the importance of accurate and proper communication of this science to the public.

It is my intention to join the IAWN if my contributions are of use to its efforts. I have read the statement of intent and I understand the obligations of IAWN members.

Regards,

A handwritten signature in black ink that reads "John T. Grage". The signature is written in a cursive style with a large, stylized initial 'J'.

John T. Grage  
Mind's Eye Observatory  
IAU W42



Projects current and past can be seen for both observatories at these links:

<https://www.mindseyeobservatory.org/>

[https://en.wikipedia.org/wiki/List\\_of\\_astronomical\\_observatories](https://en.wikipedia.org/wiki/List_of_astronomical_observatories)

<https://newton.spacedys.com/neodys/index.php?pc=2.1.2&o=W42&ab=0>

<https://www.badlandsobservatory.com/>

[https://en.wikipedia.org/wiki/Badlands\\_Observatory](https://en.wikipedia.org/wiki/Badlands_Observatory)

<https://newton.spacedys.com/neodys/index.php?pc=2.1.2&o=918&ab=0>

## **Statement of Intent for Participation in the International Asteroid Warning Network**

The intent of the International Asteroid Warning Network (IAWN) is to establish a worldwide effort to detect, track, and physically characterize near-Earth objects (NEOs) to determine those that are potential impact threats to Earth. This network is comprised of a partnership of scientific institutions, observatories, and other interested parties performing observations, orbit computation, modeling, and other scientific research related to the impact potential and effects of asteroids. IAWN endeavors to foster a shared understanding of the NEO hazard and optimize the scientific return on these small celestial bodies. Herein, this statement provides guidance and operational principles for the partners in this network. This partnership is organized consistent with the concept developed within the United Nations (UN) Committee on the Peaceful Uses of Outer Space (COPUOS).

### **Participation**

Participation in the IAWN is entirely voluntary and each participant's activities are funded through their own resources. The IAWN can be supported by survey telescope operations; critical follow-up observations; orbit computation and hazard analysis; observations to characterize specific NEOs; data distribution, processing, and/or archiving; or other analysis and infrastructure contributions. New facilities and capabilities may contribute to the IAWN as they come online and are integrated into the network.

As a condition of participating in the IAWN, the partners accept the existing set of coordination roles amongst the various existing NEO network facilities and agree to a policy of free and open exchange of all data submitted to the network. Distribution of data submitted to the network may be limited for a short period during processing while these data are ingested, correlated and verified.

As conceived, the IAWN may be expanded and enhanced with the identification of new partners and the availability of new capabilities for NEO detection, follow-up, and characterization observations, together with the methods to analyze these data products. As current survey and follow-up capabilities are limited, global coordination and distribution of effort is highly desired.

### **Operational Principles**

The overall needs, goals, and objectives of the IAWN are to:

- Maintain, support, and enhance existing ground-based observation facilities that currently perform discovery and physical characterization of NEOs;
- Develop international rapid all-sky search capacity, geared towards discovering small, imminent impactors;
- Build ground-based facilities to globally survey larger areas of sky to fainter magnitudes;

- Develop a well-positioned space-based infrared survey to discover objects much faster than the current rate; and
- Establish an international communication policy and procedures regarding close approaches and impact risks.

To execute the objectives above, the functions of the IAWN are to:

1. Discover, monitor, and characterize potentially hazardous NEOs using optical and radar facilities and other assets based in the northern and southern hemispheres and in space;
2. Provide and maintain an international clearing house for the receipt, acknowledgement, and processing of all NEO astrometric observations and orbits to provide a global NEO database;
3. Serve as the international focal point for accurate information on the NEO population and any hazards they pose to the Earth;
4. Compute precision orbit determination of specific NEOs that pose a threat with the Earth and provide appropriate warning and evaluation of that threat;
5. Provide a portal for characterization data on potentially dangerous NEOs that are of great interest;
6. Coordinate campaigns for observing potentially hazardous NEOs;
7. Support the development and use of numerical and other theoretical modeling to obtain broader understanding of object characteristics and thus to augment what can be achieved via direct observation;
8. Recommend policies regarding criteria and thresholds for notification of an emerging NEO impact threat;
9. Develop a database of potential impact consequences, depending on geography, geology, population distribution, and other related factors;
10. Assess hazard analysis results and communicate them to entities identified by partners as being responsible for the receipt of notification of an impact threat in accordance with established policies; and
11. Assist Governments in the analysis of impact consequences and in the planning of mitigation responses.

### **Communication Strategy and Planning**

The signatories to this Statement of Intent recognize the importance of being adequately prepared for communications with a variety of audiences about NEOs, close approaches, and NEO impact risks. Participants in the IAWN recognize the need to consult with experts in science communication, risk communication, public policy analysis, and emergency management in developing messages and other content for communication with various audiences. The IAWN intends to be coordinated and prepared for communicating effectively the nature of the NEO hazard and detection of any specific impact threats with national and international political leaders, policy makers, emergency managers, and the general public. Signatories agree to coordinate with validated authoritative sources for:

- astrometric and orbital data (via the International Astronomical Union (IAU)-mandated



Minor Planet Center (MPC));

- the computation of impact probabilities (NEODyS and NASA's NEO Program Office);
- the ensuing actions aimed at improving the knowledge of the relevant NEOs (NASA's NEO Program Office and the ESA NEO Coordination Centre);

before the release of any statements to the media or public warning of the potential for impact of any specific asteroid or comet threat.

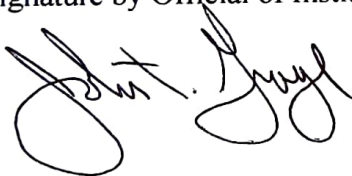
### **The IAWN Steering Committee**

Representatives of core capabilities for the IAWN intend to form a Steering Committee to better coordinate the operation and interchange of the network, and guide its growth, enhancement and evolution. The Steering Committee intends to meet on approximately an annual basis to perform a review and provide guidance and recommendations. All partners in the IAWN are welcome to send representation to the Steering Committee meetings.

### **Signature:**

The objectives of the IAWN can only be realized through a global multilateral partnership dedicated to a better understanding of the NEO impact hazard. Signature on this Statement of Intent serves as an expression of interest in supporting the IAWN and its objectives, but does not constitute a binding commitment.

[Signature by Official of Institute/Organization]

A handwritten signature in black ink, appearing to be "John J. ...", written in a cursive style.