

Scope, objectives and first results of the Space Mission Planning Advisory Group (SMPAG)

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SMPAG background

- **The United Nations formed the Action Team 14 to address NEO mitigation issues.**
- **They recommended the formation of 2 groups: IAWN and SMPAG.**
- **The formation of SMPAG was endorsed by the UN in 2013.**
- **SMPAG was officially established in 2014.**

- **The purpose of the SMPAG is to prepare for an international response to a NEO impact threat through the exchange of information, development of options for collaborative research and mission opportunities, and NEO threat mitigation planning activities.**

SMPAG background

- **SMPAG is an international technical/scientific group with some political 'touch'**
- **SMPAG is an advisory group. It should present options for NEO mitigation missions to decision makers but has no decision power itself**
- **Membership is open to national Space Agencies or other governmental or inter-governmental space entities who can contribute to Planetary Defense space missions**
- **SMPAG works by consensus**
- **All costs (e.g. for studies, simulations and meetings) has to be covered by its members**

SMPAG Membership and Set-up

(Status 26 April 2021)

- **At present SMPAG has 19 official members and 6 permanent observers.**
- **ESA is presently Chair of SMPAG**
- **UNOOSA is the Secretariat to SMPAG**
- **SMPAG has established a workplan comprising 11 items**
- **SMPAG typically meets twice per year**
- **SMPAG reports annually to the STSC of UNCOPUOS**

SMPAG Membership

(Status 26 Apr 2021)

Official members with nominated delegations:

AEM (Mexico)	ISA (Israel)
ASI (Italy)	JAXA (Japan)
Belpo (Belgium)	KASI (South Korea)
CNES (France)	NASA (USA)
CNSA (China)	
Czech Republic	ROSA (Romania)
DLR (Germany)	ROSCOSMOS (Russian Federation)
ESA	SSAU (Ukraine)
FFG (Austria)	SUPARCO (Pakistan)
IAWN (ex officio)	UKSA (UK)

Permanent Observers: ASE, IAA, IAU, UNOOSA, ESO, COSPAR

SMPAG work plan

A list of 11 initial activities has been identified by SMPAG. These activities and their status are described in a workplan.

This workplan is a living document. Activities could be modified, added or combined.

2 examples of workplan activities:

- **Criteria and thresholds for impact threat response actions.**
 - **This task was addressed jointly with the International Asteroid Warning Network (IAWN) and is completed (see next slide)**
- **Study the nuclear device option**
 - **As this is a politically sensitive issue it was agreed to collect publicly available reports and articles on the subject**

IAWN/SMPAG Thresholds

- **Issue warnings if object**
 - has an impact probability $> 1\%$
 - is $>$ ca 10 m in diameter
- **Prepare for civil protection measures if object**
 - has an impact probability $> 10\%$ within 20 years
 - is $>$ ca 20 m in diameter
- **Start to assess space mission options if object**
 - has an impact probability $> 1\%$ within 50 years
 - is $>$ ca 50 m in diameter

SMPAG achievements and status

- **Recommendations were issued to:**
 - **Perform a demonstration of an asteroid deflection mission (DART/HERA, [now ongoing](#))**
 - **Perform small-class high-velocity flyby missions to small bodies like Comet Interceptor of ESA or DESTINY+ of JAXA ([both are in preparation](#))**
- **A joint SMPAG/IAWN/UNOOSA brochure was produced (ST/SPACE/73) available at [unoosa.org](#)**
- **Several presentations and publications on IAWN/SMPAG were made**
- **See [smpag.net](#) for reports and most presentations given at SMPAG meetings**

SMPAG achievements and status, cont.

- An ad-hoc working group on legal issues (SMPAG Legal WG) was officially established during the 7th SMPAG meeting in Oct 2016
- The Legal WG made a major effort to review and assess existing space laws relevant for planetary defence
- A Report of the Legal WG entitled '**Planetary Defence, Legal Overview and Assessment**' has been produced and delivered to SMPAG.
- It is available at smpag.net.

SMPAG Exercise

- **It is discussed to perform SMPAG exercises**
- **These would assess space mission options for a threatening objects with the aim to e.g.:**
 - **Practice and test the working procedure of SMPAG**
 - **Assess the status of available knowledge and tools for Planetary Defense missions**
 - **Practice the coordination and flow of information between participants**
 - **Prepare an output format of the assessment results and advise for decision makers**
 - **As a realistic case a virtual impactor from an existing object in the risk list could be used for the exercise**
- **A preparatory workshop is planned during this summer to assess the effort, feasibility, requirements, format, etc... for such an exercise.**

SMPAG Overview

Deep Impact Mission Comet Tempel 1 Impact in 2005

Image: NASA

A black and white photograph of Comet Tempel 1, showing its nucleus and a bright impact flash on its surface. The comet is irregularly shaped and covered in craters. A bright, glowing impact flash is visible on the right side of the nucleus, with a faint, diffuse cloud of dust and gas trailing behind it. The background is dark, suggesting space.

Thank you for your attention