



# UN COPOUS: LTS Expert Group C and New Space Weather Expert Group

*Prof. Ian R. Mann and Prof. T. Obara*

University of Alberta, Canada.  
Tohoku University, Sendai, Japan.

• [imann@ualberta.ca](mailto:imann@ualberta.ca)



## Heritage

- Builds on work of Expert Group C on Long-Term Sustainability of Outer Space Activities (LTS) in UN Committee on Peaceful Uses of Outer Space (COPUOS). 2011- 2016+.
- New future as Space Weather Expert Group with Rapporteur, reporting to UN COPUOS under permanent agenda item. Approved Feb. 2015 in Vienna.

Opportunity to define activities of the new Space Weather Expert Group to meet needs of international community.



## Expert Group C on Space Weather: Terms of Reference:

- (i). Collection, sharing, and dissemination of data, models, and forecasts;*
- (ii). Capabilities to provide a comprehensive and sustainable network of sources of key data in order to observe and measure phenomena related to space weather in real or near-real time;*
- (iii). Open sharing of established practices and guidelines to mitigate the impact of space weather phenomena on operational space systems;*
- (iv). Coordination among States on ground-based and space-based space weather observations in order to safeguard space activities.*



# Guidelines – each with Best Practices:

- Guideline 1: Space weather entities, and member states and national and international organisations, should support and promote the collection, archiving, sharing, inter-calibration and dissemination of critical space weather data. (TOR-(i); TOR-(iv))
- Guideline 2: Member States and their national and international agencies should support and promote further **coordinated** development of advanced space weather models and forecast tools in support of user needs. (TOR-(ii))
- Guideline 3: Member States and their national and international agencies should support and promote the coordinated sharing and dissemination of space weather model outputs and forecasts. (TOR-(i))
- Guideline 4: Member States and their national and international agencies should support and promote the collection, sharing, dissemination and access to information relating to best practices for mitigating the effects of space weather on terrestrial and space-based systems and related risk assessments. (TOR-(iii))
- Guideline 5: Member States and their national and international agencies should promote the education, training and capacity building required for a sustainable global space weather capability. (TOR-(iii))



## Future:

- Expert Group C and available as UN COPUOS documentation as document A/AC.105/C.1/2014/CRP.15 from the fifty-second meeting of the COPUOS Scientific and Technical Subcommittee held in February 2014.
- LTS Working Group still working on finalizing consolidated draft guidelines (including space weather).
- Overall LTS guidelines are concise and high level – work of LTS EG-C can will be continued under COPUOS STSC permanent Space Weather agenda item.



# First Expert Group Meeting: Feb. 2015

- The Expert Group met for the first time on the 4 February 2015 on the margins of STSC, following the previous days U.S. organised Workshop on “*Space Weather Services to Build Global Resilience*” whose presentations informed the discussion at this first meeting of the new UN Space Weather Expert Group.
- The goal of the Expert Group meeting was  
*“To establish a proposal for consideration by the UN COPUOS Science and Technical Subcommittee (STSC) at its February 2015 meeting for the Terms of Reference, Scope and initial Schedule of Work for an Expert Group on Space Weather, and whose work will be completed and approved annually under the Space Weather agenda item of UN COPUOS STSC.”*
- The meeting defined a consensus for the way forward, with a **Mandate** and **Work Plan** for the future. This was approved by UN COPUOS in February 2015.



Photos by G.Maeda

4 Feb 2015 Canada SW Meeting at UN-Vienna

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# UN Space Weather Expert Group

- Mandate: Promote awareness, provide guidance, and enable communication and cooperation in space weather related activities among Member States and related national and international organisations.
- Focus: To promote awareness, communication, and provide guidance and enable cooperation in space weather related activities.
- Specific actions and definite outcomes: Ensure that the work is complementary to other space weather coordination activities such as those within the WMO, ISES, COSPAR, ILWS, ICAO etc.





## Work Plan

- Examine the report and conclusions of the **LTS Expert Group C** on space weather ([A/AC.105/C.1/2014/CRP.15](#)) and other information related to space weather including the recent report from the **COSPAR-ILWS Roadmap team** “Understanding Space Weather to Shield Society”. The group will examine the guidelines, recommendations and best practices to **identify mechanisms to promote their implementation, including an assessment of prioritization.** [year 1]
- **Complete an inventory of relevant United Nations organisations**, including the World Meteorological Organisation (WMO) and International Civil Aviation Authority (ICAO) and others, **and those within Member States and national and international organisations.** Identify and assess their role in the global space weather effort, **promote coordination and communication between them**, and ensure that the efforts of STSC are complementary. [years 1-2]
- **Promote increased and expanded member State involvement** in providing **space weather monitoring**, from the ground and in space, and in **developing, advancing, and sharing and delivering space weather services.** [years 2-4]
- **Report yearly to the COPUOS STSC** on its progress.



# Agenda

Day 1: (am and pm) Review National and International Activities (open to all).

Day 2: (am and pm) Focus on COSPAR-ILWS Space Weather Roadmap (open to all)

Consider Geomagnetically Induced Currents (GICS) - Pathway 1 from COSPAR-ILWS Space Weather Roadmap.

Review GIC impacts then assess pathways and routes to implementation.

Workshop mode:

WG-1 on Pathway I-1: “Quantify active-region magnetic structure for nascent CMEs”  
- Co-Lead Carolus Schrijver and Sergey Bogachev

WG-2 on Pathway I-2: “Solar wind-magnetosphere-ionosphere coupling inducing strong GICs”  
- Co-Lead Hermann Opgenoorth and Jan Thoemel (support from Antti Pulkkinen)

WG-3 on Pathway I-3: “Global corona and heliosphere to drive models for solar wind plasma and field”  
- Co-Lead Don Hassler and Nat Gopalswamy

Day3: (am only) Formal Expert Group Meeting (open to all)

- Define specific actions and definite outcomes for Expert Group moving forward.
- Ensure that the work is complementary to other space weather coordination activities such as those within the WMO, ISES, COSPAR, ILWS, ICAO etc.

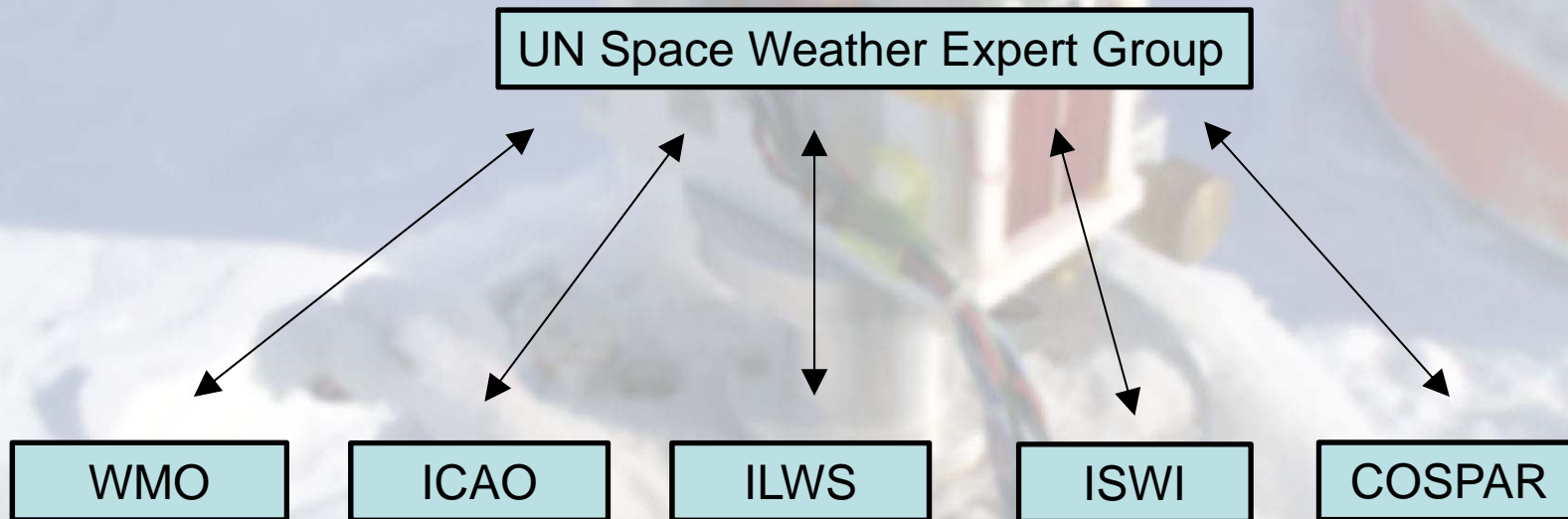


# Opportunities?

- Sharing of data, data products, and forecasts including data on space weather impacts such as power line GICs and satellite anomalies. **How?**
- International collaboration targeting maintaining critical data sets and filling key measurement gaps. **Assess impacts of filling gaps?**
- Facilitate improved understanding of importance of space weather by Member State Governments.
- **Space weather impact studies in Member States and need for SSA?**
- Leverage developing regulatory requirements for Civil Protection and mitigating space weather risks? **Opportunity for focus on GICs – and potential GIC Working Group?**
- Coordinate and review implementation through other UN bodies, including WMO, ICAO and other national and international organisations. **Assess impacts of filling gaps?**
- Promotion and support of role of ISWI in future space weather training, research and space weather operations in UN context? **Formal recognition of ISWI activities inside UN COPUOS Space Weather agenda item?**
- More...



# Communication and Implementation of Best Practices



Plus others....

# Active Participation Critical to Success

*the UN EG Space Weather*  
Ask not what ~~your country~~ can do for  
you....



*the UN Expert Group*  
...ask what you can do for ~~your country~~.

• Email: [imann@ualberta.ca](mailto:imann@ualberta.ca)

John F. Kennedy

*Space Weather* has a wide range of impacts on terrestrial and space-based infrastructure.

International co-ordination and collaboration is critical for *long-term sustainability of outer space activities* (LTOSA).

