



# First phase at COMet in operational Space Weather

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**Centro Operativo per la Meteorologia**

Space Weather Prediction Section, Head

*Pratica di Mare*

## **Contents:**

- Introductory phase of Space Weather topic in Italian Air Force framework, years 2012-2015;
- initial steps in Space Weather at COMet, considering as end state what WMO and ICAO have already planned for the safety of air navigation.

# 2012 IAF started facing the Space Weather issue

The first public event on Space Weather information was a seminar sponsored by IAF and held September 18 2012, at Centro Alti Studi della Difesa in Rome.

Already in that first moment, IAF promoted a multidisciplinary and multiagency approach to the topic, with possibly public-private effort, in order to reach in the coming years a proper approach towards the needs of air navigation safety.



**AGENDA**

09.00-09.15 Saluto di benvenuto  
Gen. SA Orazio PANATO Presidente Centro Alti Studi Difesa  
Gen. SA Roberto CONSI Sottocapo di Stato Maggiore Aeronautica  
Gen. SA Carlo MAGRASSI Vice Comandante del Comando Squadra Aerea

09.15-09.45 Sezione 1 – **INTRODUZIONE ALLA TEMATICA DELLO SPACE WEATHER**  
Prof. Mauro MESSEDDI Istituto Nazionale di Astrofisica-Osservatorio Astronomico di Trieste e Dipartimento di Fisica Università di Trieste, Docente di Meteorologia e Climatologia dello Spazio  
*Impatto delle tempeste spaziali sulla società: previsione e mitigazione nel quadro internazionale*

09.45-10.15 Sezione 2 – **EFFETTI IONOSFERICI**  
Dott. Bruno ZOLESI Direttore della Sezione di Geomagnetismo e Aeronomia dell'INGV (Istituto Nazionale di Geofisica e Vulcanologia)  
*Fisica e Radiopropagazione Ionosferica*  
Dott. Enrico ZUCCHERETTI (INGV)  
*Lo Space Weather e la Ionosfera*

10.45-11.15 Sezione 3 – **EFFETTI MAGNETOSFERICI E GEOMAGNETICI**  
Dott. Antonio MELONI Dirigente e Componente Consiglio Direttivo (C4A) INGV  
*Le osservazioni del Campo Magnetico Terrestre nell'Istituto Nazionale di Geofisica e Vulcanologia*  
Dott.ssa Paola DE MICHELIS (INGV)  
*Lo Space Weather e la Magnetosfera*

11.15-11.45 Sezione 4 – **SEGMENTO SPAZIALE**  
Giulio CESARI Tollerante Alti Studi Difesa  
Sottos. CESARE Tollerante Alti Studi Difesa  
*Influenza dell'attività solare sulle missioni spaziali*

11.45-12.15 Sezione 5 – **LE CARATTERISTICHE DI UN SERVIZIO OPERATIVO DI SPACE WEATHER**  
Col. Gen. Luigi DE LEONIBUS Stato Maggiore A.M.-USAM Capo Reparto Meteorologia  
*Potenzialità dell'A.M. per la costituzione di un Servizio nazionale per lo Space Weather*

12.15-13.00 Sezione 6 – Tavola rotonda con rappresentanti del mondo istituzionale, industriale ed accademico.

CASD  
Piazza della Rovere 83  
00165 ROMA

Seminario sulla  
*Space Weather Awareness*

CASD – Palazzo Salviati  
18 Settembre 2012

SMA USAM  
"Reparto Meteorologia"  
SMA 3° Reparto 3° Ufficio  
"Politica Spaziale Aeronautica"  
Viale dell'Università 4  
00185 Roma

Per informazioni  
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RINAM 600 7042

Fonte immagini web

# 2014 IAF forum on future scenario

A conference during the Semester of Italian Presidency of the Council of European Union, in Florence October 22-24, 2014: “The Multifunctional Nature of the Aerospace Domain: a European Approach”, on future perspectives of Remotely Piloted Aircraft Systems (RPAS), Single European Sky Air Traffic Management Research (SESAR) and Space Weather.



Presidenza Italiana del Consiglio dell'Unione Europea Italia2014.eu

Ministero della Difesa

**"The Multi-functional Nature of the Aerospace Domain: a European Approach"**  
Istituto Scienze Militari Aeronautiche  
Viale dell'Aeronautica, 14 - Firenze  
23 October 2014, Florence, Italy

**Annotated Agenda**  
*Panel 3: Definition and planning of a Space Weather Service in Europe, a multi-component issue*  
23 October, Thursday

08:00-09:15 Registration - "Aula Magna"

09:15-09:30 Welcome address - "Aula Magna"  
Paolo Magro, Lt General, IT Air Force Deputy Chief of Staff

09:30-10:00 Opening Remarks  
**Luigi De Leonibus**, Brig. Gen., Chair, IT Air Force, Head of Meteorological Department

10:00-10:30 Coffee Break and Group Photo

10:30-12:00 Session 1 "Space Weather, phenomena and international initiatives"  
Keynote Speakers

1. **Prof. Umberto VILLANTE** (ITA) Full Professor in Space Physics, University of L'Aquila, "Introduction on scientific aspects and operational impacts".
2. **Dr. Terrance ONSAGER** (USA), Chairman of United Nation World Meteorological Organization - Inter-programme Coordination Team on Space Weather (WMO), "WMO worldwide Space Weather coordination".
3. **Dr. Raul ROMERO** (CAN) Technical Officer, Meteorology Section, International Civil Aviation Organization (ICAO), "Space Weather and Aviation".

12:00-13:00 Buffet Lunch

13:00-14:30 Session 2 "Space Weather services, reference initiatives"  
Keynote Speakers

1. **Prof. Mauro MESSEROTTI** (ITA), Professor, Trieste Astronomic Observatory, Chair of the NATO SCI-229 Task Group on Space Environment Support to NATO SSA, "Space Weather support to NATO operations".
2. **Dr. Michael A. KELLY, Colonel, USAF** "Example of modern military Space Weather service".
3. **Dr. Robert RUTLEDGE** (USA), Space Weather Prediction Center Program Coordinator, National Oceanic and Atmospheric Administration (NOAA), "Example of modern civil Space Weather service".
4. **Dr. Juha-Pekka LUNTAMA** (ESA), Space Weather Manager Space Situational Awareness Programme European Space Agency "ESA Space Weather Initiatives".

Presidenza Italiana del Consiglio dell'Unione Europea Italia2014.eu

Ministero della Difesa

ie Break

ion 3 "Space Weather services, industrial initiatives"

note Speakers

**Dr. Bruno ZOLESI** (ITA), Research Director, Istituto Nazionale di Geofisica e Vulcanologia (INGV), "National Space Weather capacity: the Italian contribution to the global space weather".

**Ing. Massimo COMPARINI** (ITA), Chief Technical Officer, Telespazio SpA, "Industrial Space Weather involvement".

**Ing. Gianclaudio CASSISA** (ITA), Project Manager, Thales Alenia-Space, "Space Weather involvement".

**Dr.ssa Elena GIGLIO** (ITA), Agenzia per la Promozione della Ricerca Europea (APRE), "EU Supporting Space Weather initiatives, financial procurement".

**Brig. Gen. Luigi DE LEONIBUS**, Head of Meteorological Department, IT Air Force, "The initiative of the ITAF in the field of SWE".

ing Remarks

**Luigi De Leonibus, Brig. Gen.**, IT Air Force, Head of Meteorological Department and **Prof. Mauro Messerotti** (Co-chairman) of Business Time



# 2012 joining the WMO (and ICAO) SW initiative

In May 2011, the sixteenth World Meteorological Organization Congress recognized the importance of Space Weather, including this topic as one of the future mission of National Meteorological Services.



Having the responsibility to represent Italy within WMO, in October 2012 IAF joined the WMO (in coordination with ICAO) Space Weather initiative group: Inter-programme Coordination Team on Space Weather (ICTSW).

IAF sponsored the WMO framework, that will serve as a basis for the future ICAO SW related services (Annex 3 to the ICAO Conv.) IAF has the responsibility for Italy as ICAO Meteorological Watch Office (SIGMET).

CONCEPT OF OPERATIONS  
(CONOPS)  
FOR  
SPACE WEATHER INFORMATION  
IN  
SUPPORT OF INTERNATIONAL AIR  
NAVIGATION



# The WMO-ICAO way ahead

IAF in 2017 joined the renovated WMO-ICAO group: Inter-Programme Team on Space Weather Information Systems and Services (IPT-SWISS). Goal: 2020 the start of SW services.



**Strategic level** (3.7) COORDINATION, COMMUNICATION AND ADVOCACY

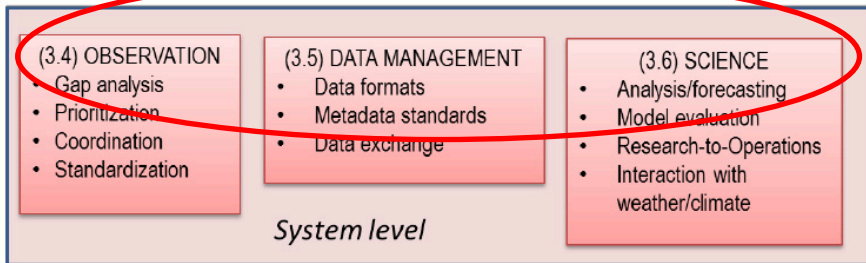
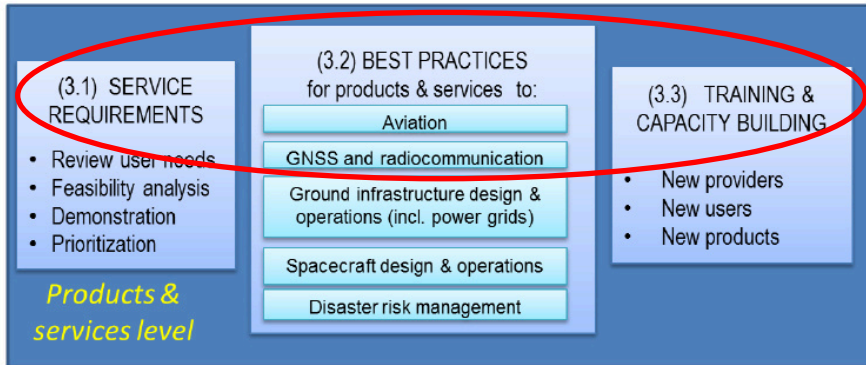


Figure 1: Schematic functional breakdown of the proposed key activities

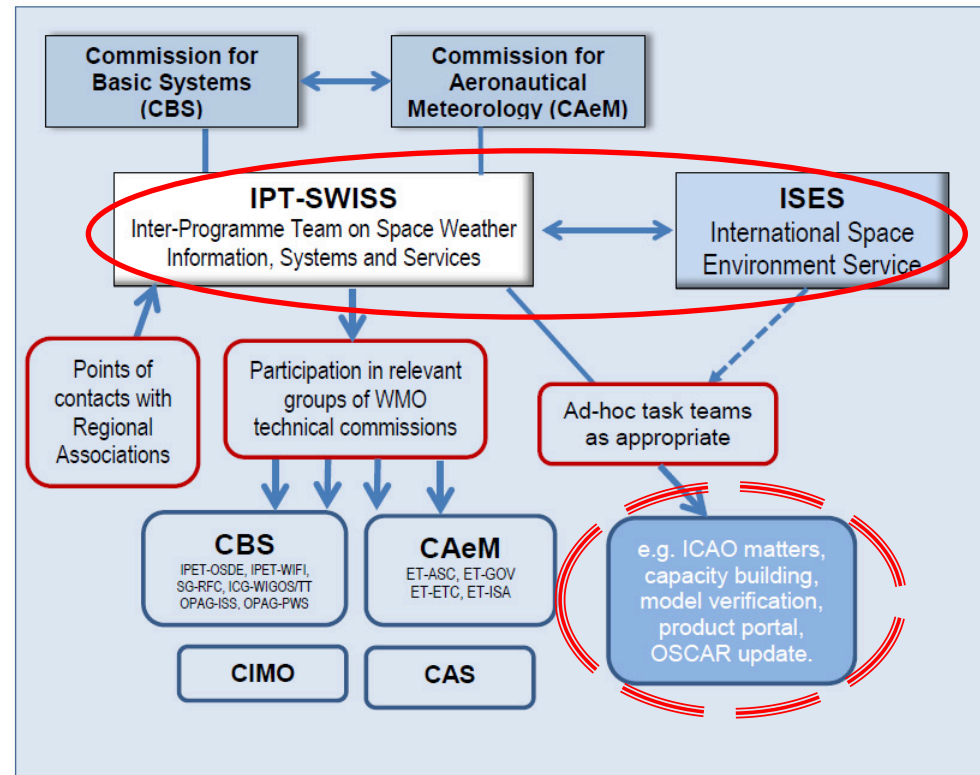


Figure 2: Proposed organization of space weather activities.

# 2015 IAF approaching the Space Weather topic

In mid-2015, with the reorganization of the Meteorological Service, the newly created “Centro Operativo per la Meteorologia” (COMet or “Operational Center for Meteorology”) based in Pratica di Mare, embedded for the first time a “Space Weather Prediction Section”.



COMet is one of the Operational Centers under the “9<sup>th</sup> Air Brigade ISTAR-EW”, (Intelligence, Surveillance, Target Acquisition and Reconnaissance - Electronic Warfare).



# Space Weather Prediction Section at COMet

Currently the COMet SW Section has been focused in preparing dedicated concise information for tactical briefings, on call, collecting already available basic data from military and open source channels.



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UNCLASSIFIED

**Ionospheric Conditions Impacting UHF SATCOM Operations**

**Space Weather - Situational Awareness** Unclass

LAST 3-DAY OBSERVATIONS

Space Weather Overview Begin 2017 05 02 00:00 UTC

Solar X-ray Flux

Flare Class: X, M, C, B, A

Solar Proton Flux

Log (pfu)

Geomagnetic Activity

Kp Index

Updated 2017 May 04 12:40 UTC Space Weather Prediction Center

NEXT 3-DAY PREDICTIONS

EVENTS

No Possible Likely

	Fri 05	Sat 06	Sun 07
EM Solar Discharged			
Charged Particle			
Geomagnetic			

IMPACTS

No Possible Likely

	Fri 05	Sat 06	Sun 07
HF Radio Comm			
UHF SatComm		Night Hrs	
High Alt Flight Radiation			
Radar Interference			
GPS Error			Night Hrs

issued 04/05/2017



***thanks for the kind attention***

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