




## 1<sup>st</sup> International Training School on

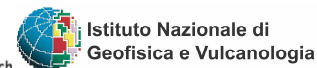
# “Convective and volcanic clouds detection, monitoring and modeling”

Castiglione del Lago, Italy, 4 –9 October, 2015



European  
Geosciences  
Union

<p><b>Keynote lecturers</b></p> <p><i>Francesco Cairo</i> (ISAC-CNR, Italy)  <i>Jean Pierre Chaboureau</i> (Univ. of Toulouse, France)  <i>Fred Prata</i> (NILU, Norway)  <i>Adrian Tompkins</i> (ICTP, UNESCO)</p>	<p><b>Lecturers</b></p> <p><i>Riccardo Biondi</i> (Wegener Center – UniGraz, Austria)  <i>Hugues Brenot</i> (BIRA, Belgium)  <i>Stefano Corradini</i> (INGV, Italy)  <i>Federico Fierli</i> (ISAC-CNR, Italy)  <i>Guergana Guerova</i> (Univ. of Sofia, Bulgaria)  <i>Nina Kristiansen</i> (NILU, Norway)  <i>Marcello Miglietta</i> (ISAC-CNR, Italy)  <i>Mario Montopoli</i> (Univ. of Rome, Italy)  <i>Mark Woodhouse</i> (Univ. of Bristol, UK)</p>
<p><b>Organizing committee</b></p> <p>Riccardo Biondi (Wegener Center – UniGraz, Austria)  Stefano Corradini (INGV, Italy)  Nina Iren Kristiansen (NILU, Norway)  Rita Nogherotto (ICTP, UNESCO)</p>	<p><b>Local Organization</b></p> <p>Island Of Meetings by ER srls  Phone: +39 3931302769  Email: <a href="mailto:info@islandofmeetings.com">info@islandofmeetings.com</a>  <a href="http://www.islandofmeetings.com">www.islandofmeetings.com</a></p> 





## Program

Time-slot	Sunday 4	Monday 5	Tuesday 6	Wednesday 7	Thursday 8	Friday 9
<b>07:30-08:15</b>			Trasimeno jogging		Trasimeno jogging	
<b>08:50-09:50</b>		Keynote talk <b>Volcanic clouds</b> <i>(Fred Prata)</i>	<b>Volcanic clouds from ground</b> <i>(Montopoli)</i>	<b>Volcanic modeling Lab</b> <i>(Kristiansen, Woodhouse)</i>	Excursion to the castle	<b>Tropical cyclones and Medicanes</b> <i>(Miglietta)</i>
<b>09:50-10:50</b>			<b>Volcano early warning systems</b> <i>(Brenot)</i>			
<b>break</b>				<b>GNSS Tomography</b> <i>(Brenot)</i>		
<b>11:10-12:10</b>		Keynote talk <b>Platforms and instruments</b> <i>(Francesco Cairo)</i>	<b>Volcanic clouds Lab and cloud discrimination</b> <i>(Corradini, Brenot, Montopoli)</i>	<b>Lunch</b>	<b>Convection form ground based sensors (GNSS and Radar)</b> <i>(Guerova)</i>	<b>Focus on GPS RO</b> <i>(Biondi)</i>
<b>12:10-13:10</b>						<b>Convection and atmospheric transport</b> <i>(Fierli)</i>
<b>Lunch</b>						
<b>14:30-15:30</b>		<b>Remarking keynotes</b> <i>(Corradini, Biondi, Kristiansen)</i>	<b>Volcanic plumes modeling</b> <i>(Woodhouse)</i>	<b>Keynote talk (2h) Convective clouds</b> <i>(Jean Pierre Chaboureau)</i>	<b>Orographic convection</b> <i>(Miglietta)</i>	<b>Data use Lab</b> <i>(Biondi, Fierli)</i>
<b>15:30-16:30</b>		<b>Volcanic clouds from IASI and AIRS</b> <i>(Fred Prata)</i>	<b>Volcanic clouds transport and inverse modeling</b> <i>(Kristiansen)</i>	<b>Keynote talk (2h) Convective physics and processes</b> <i>(Adrian Tompkins)</i>		



Time-slot	Sunday 4	Monday 5	Tuesday 6	Wednesday 7	Thursday 8	Friday 9
<b>break</b>						
<b>16:45-17:45</b>		<b>Volcanic cloud from MODIS and SEVIRI</b> <i>(Corradini)</i>	<b>Students: Mereu, Lange, Pardini, Deligne</b>	<b>Remarking keynotes</b> <i>(Corradini, Biondi, Kristiansen)</i>	<b>Students: Singh, Aremu, Kanukhina, Labrador</b>	<b>Networking</b>
<b>17:45-18:45</b>			<b>Poster session</b>	<b>Modeling convective systems</b> <i>(Jean Pierre Chaboureau)</i>	<b>Poster session</b>	
<b>19:30</b>	Icebreaker (Restaurant La Cantina)	Dinner (Restaurant La Pigra Tinca)	Dinner (Restaurant L'Acquario)	Dinner (Restaurant La Cantina)	Dinner (Restaurant La Capannina)	<b>Closure</b>
<b>21:30</b>				Ice cream night		

### Legend

	Volcanic clouds topics
	Convective clouds topics
	Instruments
	Networking time
	Students' time



## Detailed program v5

### Day 0 - Sunday afternoon

19:00 Icebreaker at Restaurant La Cantina

### Day 1 - Monday (Introduction day)

8:50 Hazardous volcanic clouds: challenges, techniques and future, **Fred Prata** - **(Keynote talk)**

1. Quantitative satellite remote sensing of volcanic ash: Theory and observations. Examples and case studies, error treatment, and validation.
2. Effects on aviation. Ash effects on aircraft. Systems for hazard warnings, VAACs, observations from observatories and other sources, using satellite data. The regulatory environment.
3. Future directions and research - thin layers and particle size distributions, airborne and ground-based systems, better satellite instruments.

10:50 Coffee Break

11:10 Platforms and instruments: from the balloons to the satellites, **Francesco Cairo – ISAC CNR** **(Keynote talk)**

*campaigns, balloons, aircrafts, satellites ... future: UAV, airships, zeppelin*

13:10 Lunch

14:30 **Remarking notes**, **Riccardo Biondi**, **Stefano Corradini** and **Nina Iren Kristiansen**

15:30 **Volcanic clouds from and hyper-spectral satellite instruments (IASI and AIRS)**, **Fred Prata** -

16:30 Coffee Break

16:45 **Volcanic clouds from and multi-spectral satellite instruments (MODIS and SEVIRI)**, **Stefano Corradini** - **INGV**



19:30 Dinner at **Restaurant La Pigra Tinca**

***Day 2 - Tuesday (Volcanic day)***

7:30 **Trasimeno jogging ... running with the lecturers ☺**

8:50 **Volcanic cloud detection and monitoring from ground based instruments, *Mario Montopoli – La Spaienza Univ.***

*Ground radar observation of volcanic ash. The lecture will introduce the attendees to the basic principles of microwave ground based radars giving the theoretical background to understand how radars are able to detect larger sized ash particles. Practical examples of radar imagery for past volcanic eruption events will be discussed and the inversion algorithms used will be explained. Particular emphasis will be given to highlight the advantages and the limitations on the use of ground radars with respect to more conventional tools.*

9:50 **Volcanic clouds early warning systems, *Hugues Brenot - BIRA***

10:50 **Coffee Break**

11:10 **Volcanic cloud Lab and cloud discrimination, *Stefano Corradini, Mario Montopoli and Hugues Brenot***

*Lab where the students will use satellite and ground based data for detecting volcanic clouds and for discriminating them from other types of clouds*

13:10 **Lunch**

14:30 **Volcanic plumes modeling, *Mark Woodhouse –***



*Volcanic plumes as the 'source' for long-range ash dispersion models. The fluid mechanics of turbulent plumes. The development of mathematical models of turbulent buoyant plumes, and their extension and application to volcanic plumes. The influence of the atmosphere on plume dynamics. The transition from plumes to ash clouds -- umbrella clouds and buoyancy-driven spreading of ash.*

**15:30 Volcanic clouds transport and inverse modeling, Nina Iren Kristiansen – NILU**

*Key information and parameters needed in order to model volcanic eruption clouds, how and why such modelling can go very wrong, and how merging ("assimilation") of satellite data into the modelling can give more realistic simulations. Demonstrations using a few case-studies will be shown. Remaining challenges and future research needs.*

**16:30 Coffee Break**

**16:45 Students presentations on volcanic clouds** (4 students 15 min each) in this order: **Luigi Mereu, Caroline Lange, Federica Pardini, Natalia Deligne**

**17:45 Poster session**

**19:30 Dinner at Restaurant L'Acquario**

### **Day 3 - Wednesday (Volcanic-Convection day)**

**9:00 Volcanic modeling Lab, Nina Iren Kristiansen and Mark Woodhouse**

**11:00 GNSS tomography and its impact on nowcasting, Hugues Brenot - BIRA**

**12:00 Lunch**

**13:30 Convective clouds: challenges, techniques and future, Jean Pierre Chaboureau –Univ. of Toulouse (Keynote talk)**

*challenges: intensity, genesis, overshooting; different detection/monitoring techniques; mesoscale modeling issues: grid resolution, microphysics, turbulence, initial conditions; future developments.*



15:30 [Physics and microphysics of convective systems](#), **Adrian Tompkins – ICTP** ([Keynote talk](#))

17:30 [Coffee break](#)

17:45 [Remarking keynotes](#), **Riccardo Biondi, Stefano Corradini and Nina Iren Kristiansen**

18:00 [Modeling convective systems](#), **Jean Pierre Chaboureau –Univ. of Toulouse**

19:30 [Dinner at Restaurant La Cantina](#)

21:30 [Icecream night](#)

#### **Day 4 - Thursday (Convective day)**

7:30 [Trasimeno jogging ... running with the lecturers](#) 😊

8:50 [Excursion at the medieval castle of Castiglione del Lago and Palazzo della Corgna](#)

11:00 [Convection from ground based sensors](#), **Guergana Guerova – Univ. of Sofia**

13:00 [Lunch](#)

14:30 [Orographic convection](#), **Mario Marcello Miglietta – ISAC CNR**

16:30 [Coffee Break](#)

16:45 [Students presentations on convection](#) (4 students 15 min each) in this order: **Prashant Singh, Olusegun Aremu, Anna Kanukhina, Lorenzo Labrador**

17:45 [Poster session](#)

19:30 [Dinner at Restaurant La Capannina](#)



**Day 5 - Friday (Convective day)**

**8:50 Tropical cyclones and Medicanes, Mario Marcello Miglietta – ISAC CNR**

*Cyclones physics and development, tropical cyclones structure and development, tropical-like cyclones in the Mediterranean: climatology, mechanisms of development, sensitivity experiments.*

**10:50 Coffee break**

**11:10 GPS radio occultations: a new technique for detecting and monitoring convective systems, tropical cyclones and volcanic clouds, Riccardo Biondi - Wegener Center**

*Radio Occultations technique, data access, applications of radio occultations for detecting and monitoring convective systems, tropical cyclones, volcanic clouds and their impact on the atmospheric structure.*

**12:10 Convection and atmospheric transport, Federico Fierli – ISAC CNR**

**13:10 Lunch**

**14:30 Data use Lab, Riccardo Biondi and Federico Fierli**

**16:30 Networking**

**18:30 Closure**