International Summer School on Applications with the Newest Multi-spectral Meteorological Satellites

Lectures in Bertinoro

23 Aug – 2 Sep 2004

Opening Welcome

Fourth Seminar after Bologna-2001, Rome-2002 and Maratea-2003

Links with the Master in Applied Meteorology of the University of Bologna

It is the end result of an international collaborative effort

INITIATIVE & Main sponsorship

- *CIMSS, NOAA*
- *Dept. of Physics, University of Bologna*

Other sponsoring Agencies:

- *European Union*
- *ARPA-SIM*
- *ISAC-CNR*

…. and also

- *Eumetsat*
- *Fondazione Cassa dei Risparmi Forlì*
- *SERINAR (Servizi Integrati d'Area)*
- *Provincia Forlì-Cesena*

Practicalities:

- *Dinner coupons: get them during coffee-break*
- *MMA students: certification of stage hours*
- *Sunday: visit to Ravenna and Cervia*
  (please sign up)
- *Social Dinner on Wednesday Sept. 1 evening*
- *"Ice breaker" after the end of today's lecture*

Remote Sensing Seminar
Lectures in Bertinoro 23 Aug – 2 Sep 2004

Paolo Antonelli
UW/CIMSS
Universita' del Sannio, ***Italy***

Rolando Rizzi
Universita' di Bologna, ***Italy***

Raffaella Matarrese
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Roberto Episcopo
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Universita' di Bologna, ***Italy***

Paul Menzel
NOAA/NESDIS/ORA


Bologna Students
September 2001


Roma Students
June 2002


Maratea Students
May 2003


Bertinoro Students
Aug 2004

BERTINORO International Summer School
Applications with the Newest Multi-spectral Meteorological Satellites
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M pm	***Welcome*** **–**	**Discussion of Agenda [*Menzel, Rizzi*]**
	***Lecture 1a*–**	**Radiation and the Radiative Transfer Equation [*Menzel*]**
	Lab **–**	**Introduction to the Labs and Hydra [*Antonelli*]**
	Ice Breaker	
T am	***Lecture 1b*–**	**Radiation and the Radiative Transfer Equation [*Menzel*]**
	***Lecture 2a*–**	**Spectral signatures of Earth's sfc & atm [*Menzel*]**
	Homework	
T pm	***Lab 1a*** **–**	**Multi-spectral Data [*Antonelli, Menzel*]**
		Staging, Viewing, Interrogating MODIS Data
W am	***Lecture 2b*–**	**Remote Sensing Advances with MODIS including cloud and aerosol detection [*Menzel*]**
W pm	***Lab 1b*** **–**	**Multi-spectral Data [*Antonelli, Menzel*]**
		Multi-spectral Sfc, Cloud, and Aerosol Properties
R am	***Lecture 3a*–**	**Introducing Infrared Hyperspectral Data [*Menzel*]**
R pm	***Lab 2a*** **–**	**High Spectral Resolution IR data [*Antonelli*]**
		Staging, Viewing, Interrogating AIRS and SHIS Data
F am	*Quiz 1*	
	Lecture 3b –	**Detecting moisture, cloud, and aerosol with High Spectral Resolution Sounders [*Menzel*]**
F pm	***Lab 2b*** **–**	**High Spectral Resolution IR data [*Antonelli*]**
		Exploring the Spectral Properties

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Sa am	*Lecture 5 –*	**Introducing MSG** [*Menzel*]
	Lab 3	**Detection of Fog, Clouds, Dust,….with MSG** [Antonelli]
Sa pm	*Work Time (homework and Labs)*	
Su	*free day*	
M am	*Discussion*	**Introducing Group Projects** [*Menzel, Antonelli*] (Cal/Val, O3, Eco Syst, Volcanic Ash, Cld & Aerosol)
M pm	*Lab 4a –*	**Group Projects** [*Antonelli, Tutors*]
T am	*Lecture 4*	**Instrument Considerations and Cal/Val** [*Menzel*]
	Lab 4b	**Continue Group Lab Projects** [*Antonelli, Tutors*]
T pm	*Lab 4c*	**Continue Group Lab Projects** [*Antonelli, Tutors*]
W am	*Hand in Homework*	
	Lab 4d	**Finish Group Lab Projects** [*Antonelli, Tutors*]
W pm	*Lab 4e –*	**Presentation of Group Lab Projects** [*Students, Antonelli*]
	Lecture 7 –	**Summary of Remote Sensing Lessons** [*Menzel, Antonelli, Tutors*]
	Group Dinner	
R am	*Discussion*	**Homework Solutions**
	Quiz 2	
	Lecture 6	**Evolving to the Future Global Observing System** [*Menzel*]
	Discussion	**Longer Term Projects**
	Concluding Ceremony	

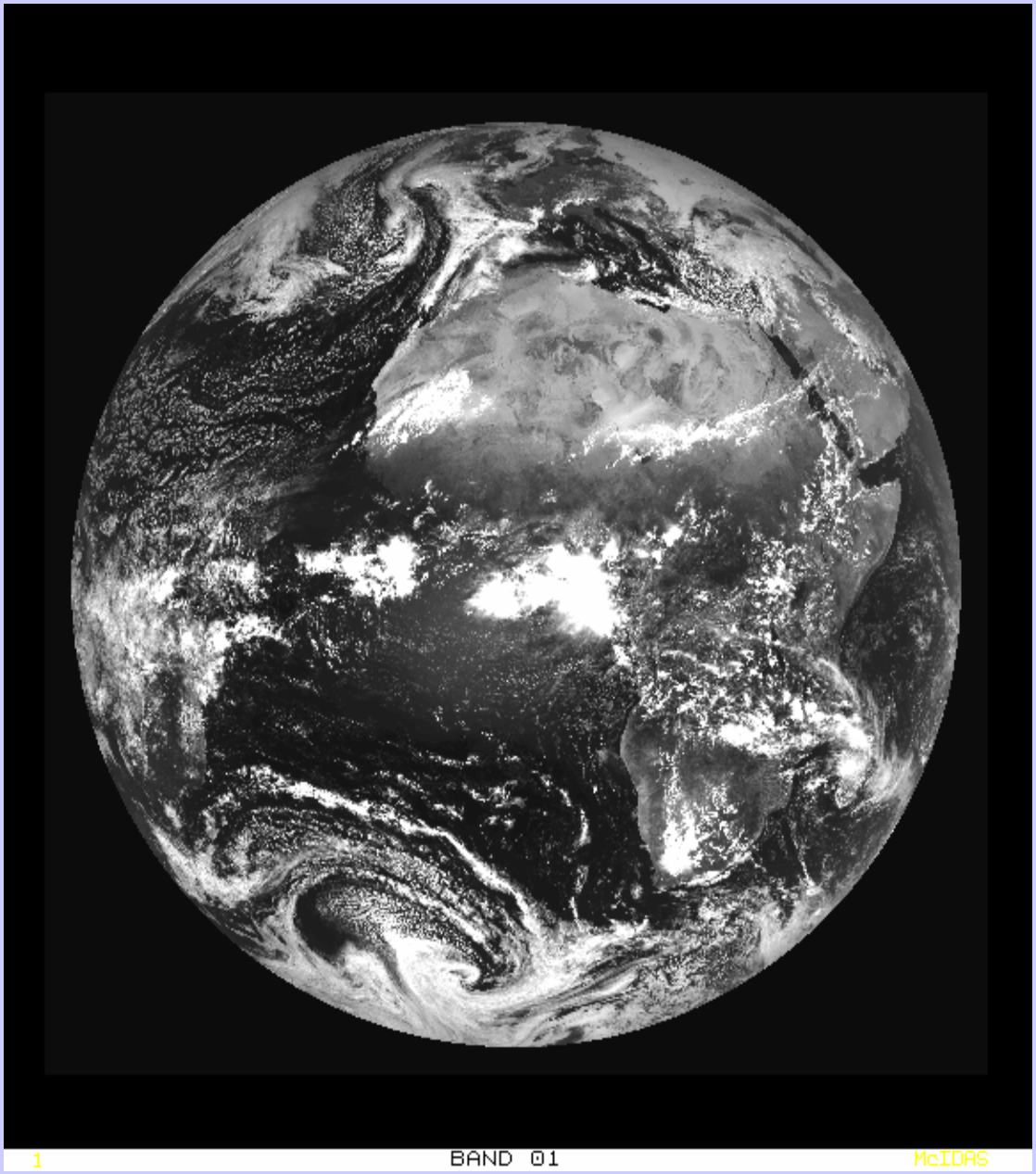
AM sessions: 10:00 am – 12:30 pm – PM sessions: 2:30 pm – 5:00 pm

http://barrage.ssec.wisc.edu/~paoloa/teaching/Bertinoro2004/html/index.html

WMO TD 1078 "Applications with Meteorological Satellites"

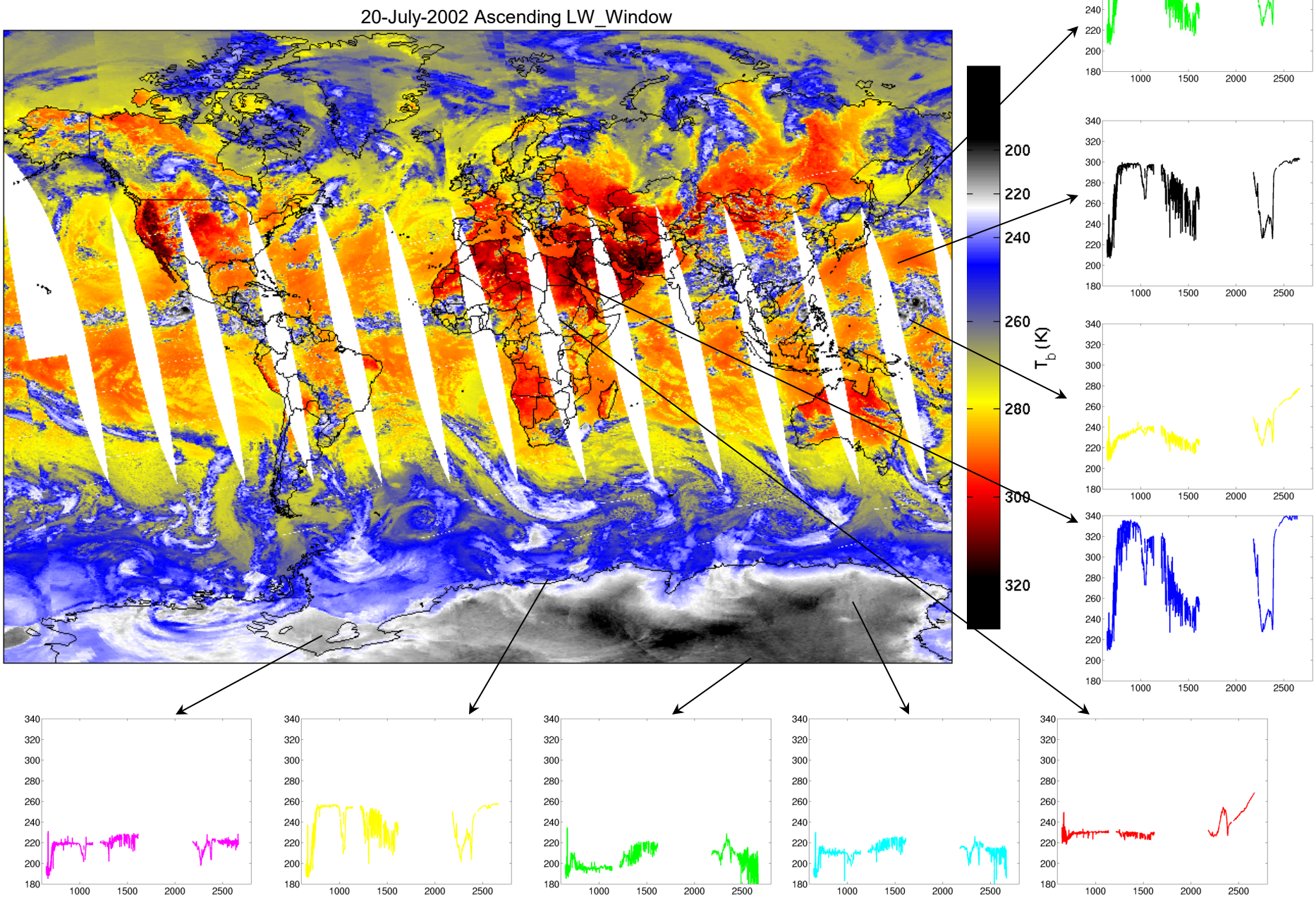

MODIS

MSG



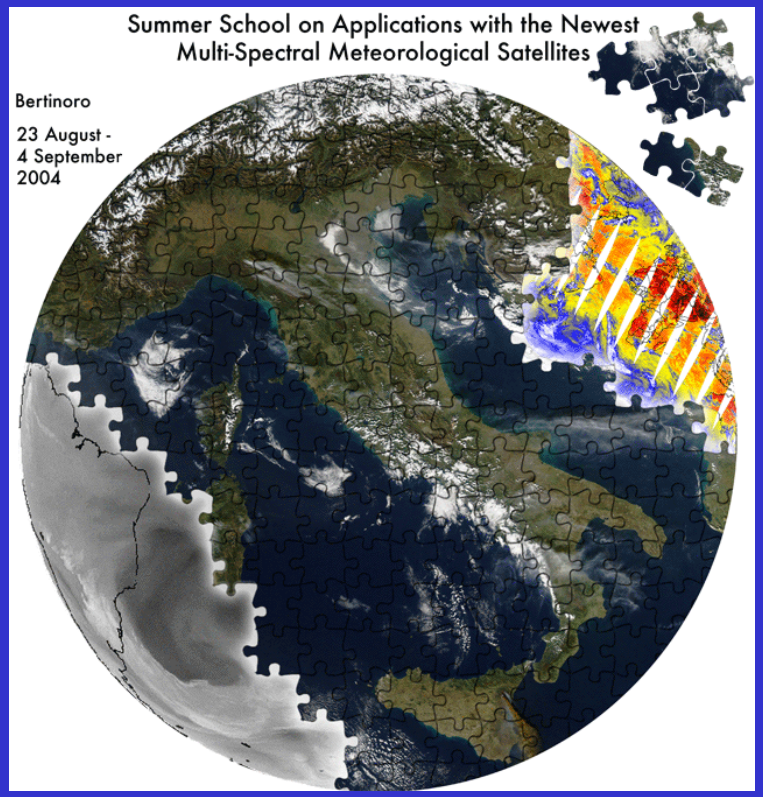
HRV	Broadband
VIS0.6	0.635
VIS0.8	0.81
NIR1.6	1.64
IR3.9	3.90
WV6.2	6.25
WV7.3	7.35
IR8.7	8.70
IR9.7	9.66
IR10.8	10.80
IR12.0	12.00
IR13.4	13.40

AIRS


20-July-2002 Ascending LW_Window
200
220
240
260
280
300
320
T_b (K)
340
320
300
280
260
240
220
200
180
1000
1500
2000
2500

WMO TD "Applications with Meteorological Satellites" can be obtained from DHinsman@wmo.int

Homework, Lab Exercises, Lecture ppt presentations are or will be available on CD & the seminar web page **http://barrage.ssec.wisc.edu/~paoloa/teaching/Bertinoro2004/html/index.html**



Students

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Laura Copersino
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Fiammetta Orione
Massimo Pilolli
Sara Poluzzi
Yoshiro Tanaka
Nouara Tinakiche

Daniele Biron
Rosario Cutuli
Antonio Gioia
Matteo Masotti
Pietro Napolitano
Petr Pesice
Enrico Pisoni
Damiano Santillo
Du Duc Tien
Giulio Todini