

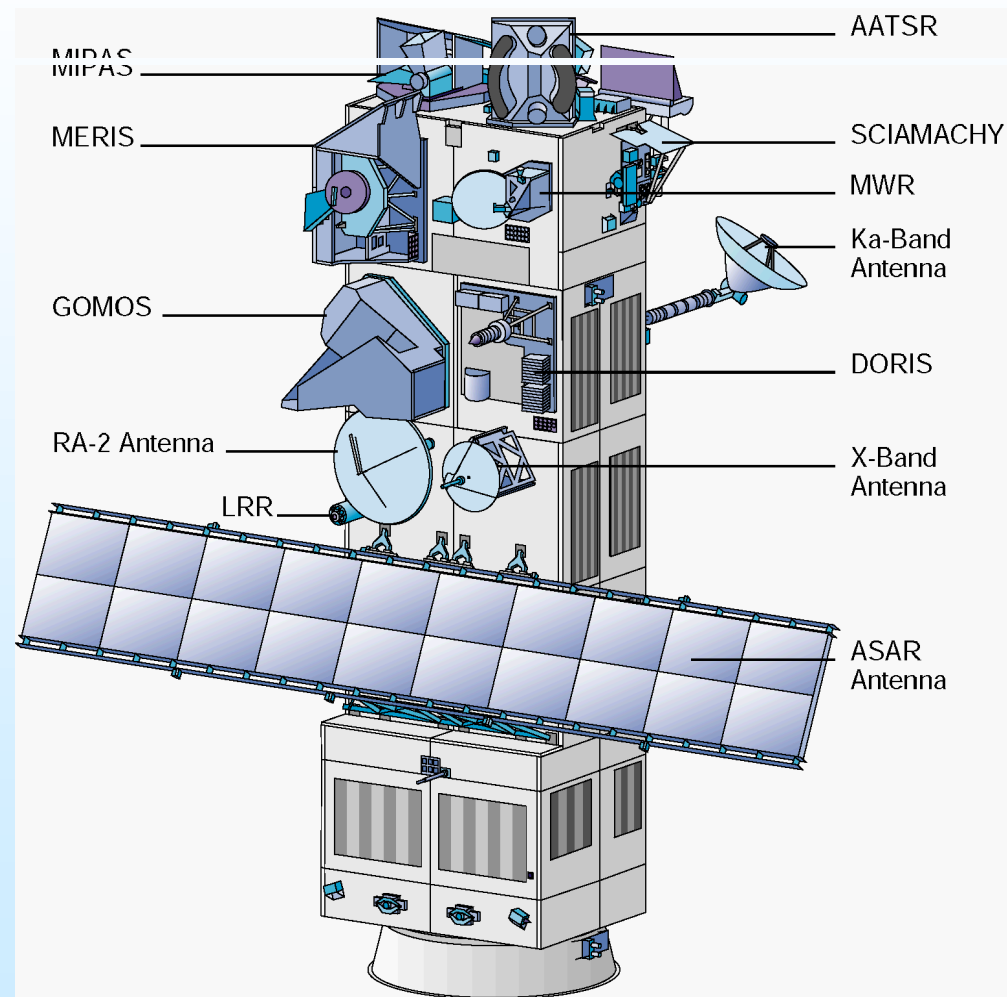
# ***ACVE-2***

## ***Welcome and Introduction***

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*ESA / ESTEC*

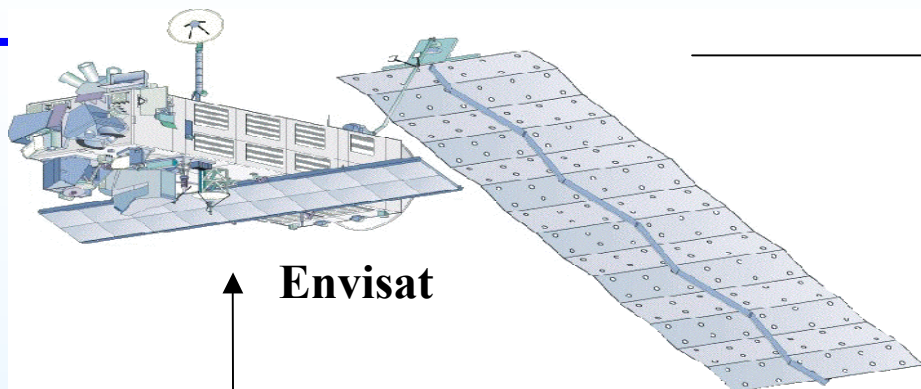
## The Environmental Satellite *Envisat*

- ESA's largest Earth observation mission so far
- Launcher: Ariane-5
- Orbit: near-polar at 98.5° inclination
- Launch date: March 2002
- Atmospheric variables measured by
  - MERIS, MWR (meteorology)
  - GOMOS, MIPAS, SCIAMACHY (chemistry)
- Land surface variables measured by
  - AATSR, MERIS
- Marine variables measured by
  - AATSR, ASAR, MERIS, RA-2

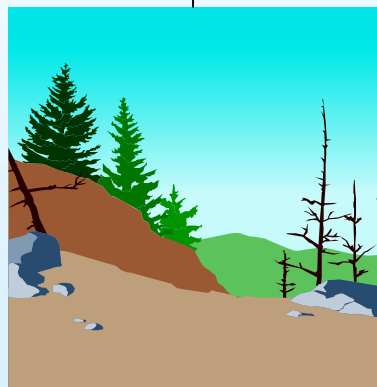


## CEOS Definitions for Calibration and Validation

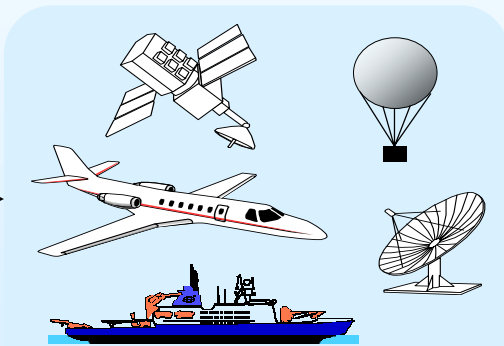
- Calibration
  - *is the process of quantitatively defining the system response to known, controlled signal inputs.*
- Validation
  - *is the process of assessing by independent means the quality of the data products derived from the system outputs.*



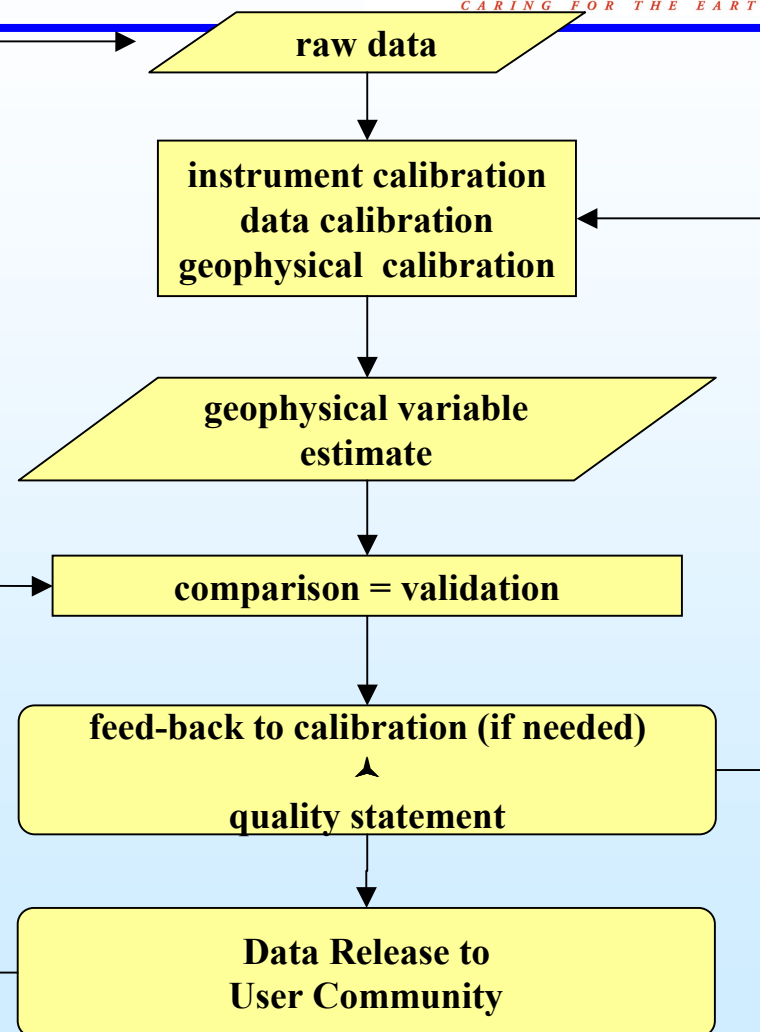
↑ **Envisat**



**observed scene**



**validation instruments**



## Envisat Geophysical Data Products

### Atmospheric Parameters

- Profiles of Pressure, Temperature, O<sub>3</sub>, H<sub>2</sub>O, NO<sub>2</sub>, NO<sub>3</sub>, H<sub>2</sub>O, CH<sub>4</sub>, HNO<sub>3</sub>
- Columns of O<sub>3</sub>, NO<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>O, CO, CH<sub>4</sub>, OCIO, H<sub>2</sub>CO, SO<sub>2</sub>
- Aerosol Extinction, Optical Thickness, Type, Absorption Indicator
- Cloud Cover Fraction, Cloud Top Height & Pressure, Cloud Albedo and Optical Thickness

### Land Surface Parameters

- Vegetation Index, Reflectance, Surface Temperature & Pressure

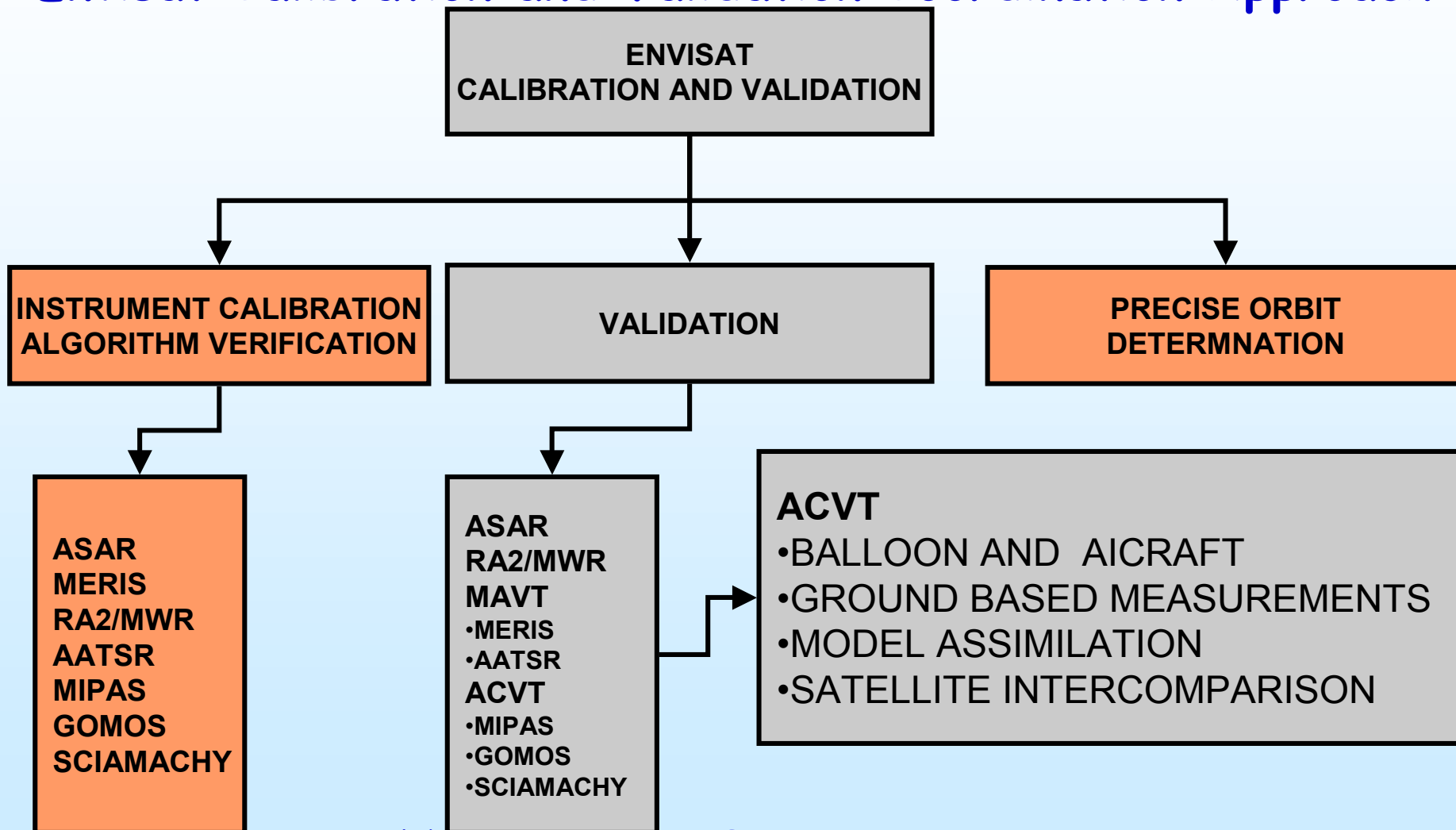
### Marine Parameters

- Significant Wave Height, Wind Speed, Sea Surface Temperature
- Water-leaving Reflectance, Yellow Substance, Chlorophyll, Suspended Matter, PAR (fluorescence)

## Validation Requirements

- **Sufficiently large number of correlative measurements of sufficient quality**
  - covering large area and wide range of conditions
  - comparable to satellite observations
  - under strict data quality control (established, well-defined techniques)
- **(Statistical) data analysis and algorithm verification**
- **Feedback to (engineering) calibration**
- **Recommendation for algorithm improvement**
- **Monitoring (geophysical) data quality during mission life time**

# Envisat Calibration and Validation Coordination Approach



## Validation Schedule

Selection of AO proposals	End 1998
Formation of validation teams	Mid 1999
Implementing facilities and S/W development	July 1999 to launch
Rehearsal	2000/2001
Launch & start of commissioning phase	March 2002
Start data acquisition and analysis	March/June 2002
Calibration Review	
- <i>L1b fully verified, L2 preliminary verified</i>	
- <i>no release of data to the general public before</i>	September 2002
Commissioning phase workshop	
- <i>L2 preliminary validation</i>	December 2002
ACVT re-processing	January 2004
Long-term validation	started in 2004

## ACVE-2 Workshop Objectives

- The Workshop on Atmospheric Chemistry Validation of ENVISAT will review the results of the validation of the Atmospheric Chemistry geophysical data after the first major processor upgrade.
- The objectives of the ACVE-2 are:
  - to review the Level 2 product algorithms using the results of the validation campaigns,
  - to review the geophysical consistency of the Level 2 processor products,
  - to provide an error estimation of the Level 2 products,
  - where needed, to recommend instrument re-calibration and algorithm development.
  - to recommend on the incorporation of new products

GOMOS	MIPAS	MIPAS	SCIAMACHY			SCIAMACHY			SCIAMACHY		
GOPR 6.0	IPF 4.61	IPF4.61	IPF 5.01								
GOM_NL_2P	MIP_NL_2P	MIP_NL_2P	SCI_NL_2P			SCI_OL_2P			SCI_OL_2P		
Dark Limb	NRT	Offline	Nadir			Nadir			Limb		
			UV-Vis	IR	UV-IR	UV-Vis	IR	UV-IR	UV-Vis	IR	UV-IR
density	P	P								p	
T	T	T								T	
O <sub>2</sub>											
O <sub>3</sub>	O <sub>3</sub>	O <sub>3</sub>	O <sub>3</sub>			O <sub>3</sub>			O <sub>3</sub>		
H <sub>2</sub> O	H <sub>2</sub> O	H <sub>2</sub> O		H <sub>2</sub> O			H <sub>2</sub> O			H <sub>2</sub> O	
NO <sub>2</sub>	NO <sub>2</sub>	NO <sub>2</sub>	NO <sub>2</sub>			NO <sub>2</sub>			NO <sub>2</sub>		
	N <sub>2</sub> O	N <sub>2</sub> O		N <sub>2</sub> O			N <sub>2</sub> O			N <sub>2</sub> O <sup>T</sup>	
NO <sub>3</sub>											
	HNO <sub>3</sub>	HNO <sub>3</sub>									
OcIO			OCIO*			OCIO*					
			BrO* <sup>T</sup>			BrO			BrO <sup>T</sup>		
			H <sub>2</sub> CO*			H <sub>2</sub> CO*					
				CO			CO			CO <sup>T</sup>	
	CH <sub>4</sub>	CH <sub>4</sub>		CH <sub>4</sub>			CH <sub>4</sub>			CH <sub>4</sub>	
			SO <sub>2</sub> *			SO <sub>2</sub> *					
					Cloud cover frac.			Cloud cover frac.			
					Cloud top height			Cloud top height			
Aerosol					Aerosol abs. Index			Aerosol abs. Index			Aerosol abs. index
						UV index <sup>T</sup>					
							CO <sub>2</sub>			CO <sub>2</sub>	

## Workshop Proceedings

- Every presenter should deliver a copy of the presentation material to Peter Fletcher.
- Every ACVT member can submit a full paper describing in detail the validation tasks performed.
- Full papers of all ACVT PI's and Co-I's are due not later than **28 May 2004**.
- Papers should be sent to the Workshop Secretariat exclusively in electronic form (Word or PDF).
- Instructions to authors can be found in the workshop web pages.
- The Proceedings will be published by ESA Publications Division.

## Workshop Programme (1)

- Instrument - species based
- Results presented by species coordinator
- Discussion of the results after a number of presentations
- **SCIAMACHY**  
Monday afternoon – Tuesday morning
- **MIPAS**  
Tuesday afternoon – Wednesday morning
- **GOMOS**  
Thursday
- **SUMMARY and RECOMMENDATIONS**  
Friday morning

## Workshop Programme (2)

- POSTER SESSION  
Wednesday afternoon
- WORKSHOP DINNER  
Wednesday evening
- Daily bus transport between Frascati <-> ESRIN
- Contact ESRIN Travel Office for transportation to the airport
  
- Have a pleasant workshop