



EUROPLANET 2020-RI - VESPA WP

European Data Bases Infrastructure of Solid Spectroscopy

***SSH*ADE**

*S*olid *S*pectroscopy *H*osting *A*rchitecture of *D*atabases & *E*xpertise

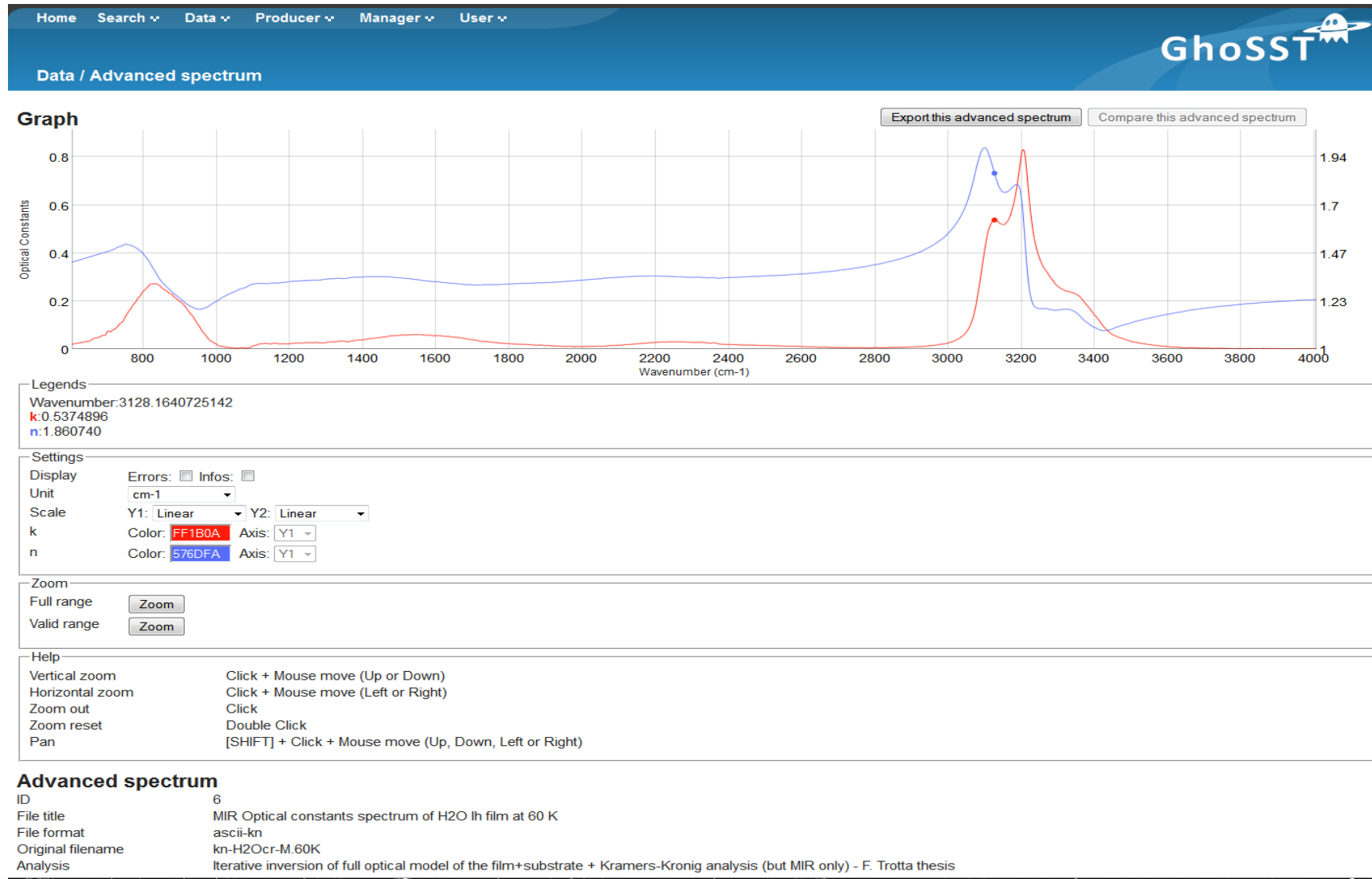
Bernard Schmitt, Philippe Bollard, Alexandre Garenne,
Damien Albert, Lydie Bonal

A little bit of history: from past to future

- 2002: Idea ...
- 2006: Concept ...
Content demonstrator: STSP
- 2007-2008: First “solid spectroscopy” datamodel
Development of technical demonstrator (OSUG, ...)
- ✓ **2009-2012:** **Full developments (Europlanet + VAMDC – FP7) of:
SSDM (Solid Spectroscopy Data Model)
and GhoSST database infrastructure**
- July 2011 GhoSST functional prototype
- ✓ **25 Sept. 2012:** **GhoSST opened to the public (v0.5 beta-version)**
- 2013-2015: Continuing SSDM and GhoSST developments
GhoSST data feeding
- ✓ **4 Feb. 2014:** **GhoSST upgrade (v0.6)**
- 2014 Preparation and opening of a pre-SSHADE database
- ✓ **2015-2019:** **Development of SSHADE infrastructure under EPN@2020-RI (VESPA JRA)
Opening of SSHADE to participating European producers (VESPA VA)**
- ✓ **Sept.-Nov. 2017:** **SSHADE online**

GhoSST Web interface

- Public version of GhoSST accessible at: <http://ghosst.osug.fr>



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SSHADÉ European Consortium of Data Providers

Consortium of **20** solid spectroscopy experimental groups
in **8** European countries (F, GB, D, I, E, CH, PL, HU)
involving **~65** peoples

Each with particular expertises on:

- some wavelength range
- specific techniques
- type of materials and physico-chemical conditions
- type of data and products, ...

SSHADÉ blog : <http://blog.sshade.eu>

The SSHADE-Europe consortium in EPN@2020-RI

- **IPAG / Planéto**, Grenoble - F (Bernard Schmitt, Philippe Bollard, Lydie Bonal, Alexandre Garenne, Damien Albert)
- **Open University**, Milton Keynes – UK (Nigel Mason)
- **IAS**, Univ. Paris-Sud - F (Emmanuel Dartois, Donia Baklouti)
- **IRAP / GPPS**, Toulouse - F (Patrick Pinet, Yves Daydou)
- **IRAP / MICMAC**, Toulouse - F (Karine Demyk, Yves Daydou)
- **LPGN**, Univ. Nantes - F (Marion Massé, Manuel Giraud)
- **Space and Planetary Science Division**, Univ. of Bern - CH (Olivier Poch, Antoine Pommerol)
- **PIIM**, Univ. Aix-Marseille - F (Patrice Theulé)
- **IAPS**, INAF, Roma - I (Alessandra Rotundi, Vincenzo della Corte)
- **IAPS**, INAF, Roma - I (Fabrizio Capaccioni, Christian Carli)
- **LISA**, Univ. Paris-Est - F (Nicolas Fray)
- **AIU Observatory**, Jena - D (Harald Mutschke, Jürgen Weiprecht) [DOCCD 'database']
- **Centro de Astrobiología**, INTA-CSIC – E (Guillermo Muñoz Caro)
- **Instituto de Estructura de la Materia**, Madrid – E (Vicente Timón, Miguel Angel Moreno)
- **LATMOS / IMPEC**, Institut Pierre Simon Laplace - F (Nathalie Carrasco)
- **LGL / ENS-Lyon** - F (Bruno Reynard, Gilles Montagnac (exp.), Razvan Caracas (theory))
- **Konkoly Astronomical Institute** – HU (Akos Kereszturi)
- **Planetary Geology Lab.**, Institute of Geological Sciences, Polish Academy of Sciences – PL (Joanna Gurgurewicz, Luigi Castaldo)
- **Clay Mineral Laboratory**, Institute of Geological Sciences, Polish Academy of Sciences – PL (***)
- **ESRF / FAME line**, Grenoble – EU / F (Denis Testemale, Isabelle Kieffer)



Data of SSHADE

- **Spectral ranges:**

- from Gamma-ray to mm/cm (through UV-Vis-IR)

- **Solids:**

- Ices (low to high pressure, low to room temperature, mixtures, matrix isolated, ...)
- clathrates hydrates, hydrates
- minerals (naturals and synthesized), rocs
- organic matter (natural and synthesized), polymers, VUV
- Extraterrestrial matter: meteorites, IDPs, ...
- also liquids

- **Data types:**

- **Spectra**

- infrared transmission spectra, absorption coefficients, optical constants
- Raman spectra et micro-spectroscopy
- reflectance spectra of surfaces, spectro-photometric functions
- multispectral and multi-angular imagery of surfaces

- **Bandlist**

- position, width, intensity, attribution ... for molecular solids

SSHAE Solid Spectroscopy Data (1)

- **IPAG** (*GhoSST*)
 - Vis-FIR spectra, optical constants and bandlists of ices, minerals/rocks, organic molecules and materials, optical materials.
 - Vis-NIR bidirectionnal reflectance spectra + BRDF of surfaces: snows, ices, minerals/rocks, organic materials, ...
 - UV-Vis Raman + Fluorescence spectra + Band parameters of organic molecules, natural et synthetic carbonaceous materials, meteorites, IDPs, Stardust grains.
 - NIR+MIR microscopic spectro-images of natural et synthetic carbonaceous materials, minerals/rocks.
- **IAS** (*DAYSY*)
 - MIR spectra of ices and clathrates hydrates
 - MIR spectra organic molecules and materials synthesized by VUV irradiation
 - MIR+FIR spectra of synthetic carbonaceous materials.
 - MIR+FIR spectra and Raman micro-spectroscopy of meteorites, IDPs, ...
- **LPGNantes** (*SSTONE*)
 - Raman spectra of ices and clathrates hydrates at high pressures
 - NIR reflectance spectra of ices, clathrates hydrates and minerals
- **IRAP-GPPS** (*PaSSTEL*) + **MICMAC**
 - multispectral and multi-angular imagery of mineral surfaces
 - multispectral photometric fonctions
 - FIR+sub-mm spectra and absorption coefficients of synthetic silicates
- **LISA**
 - MIR spectra of ices and organic polymers
- **LATMOS**
 - MIR spectra of synthetic organics (tholins, ...)

SSHAE Solid Spectroscopy Data (2)

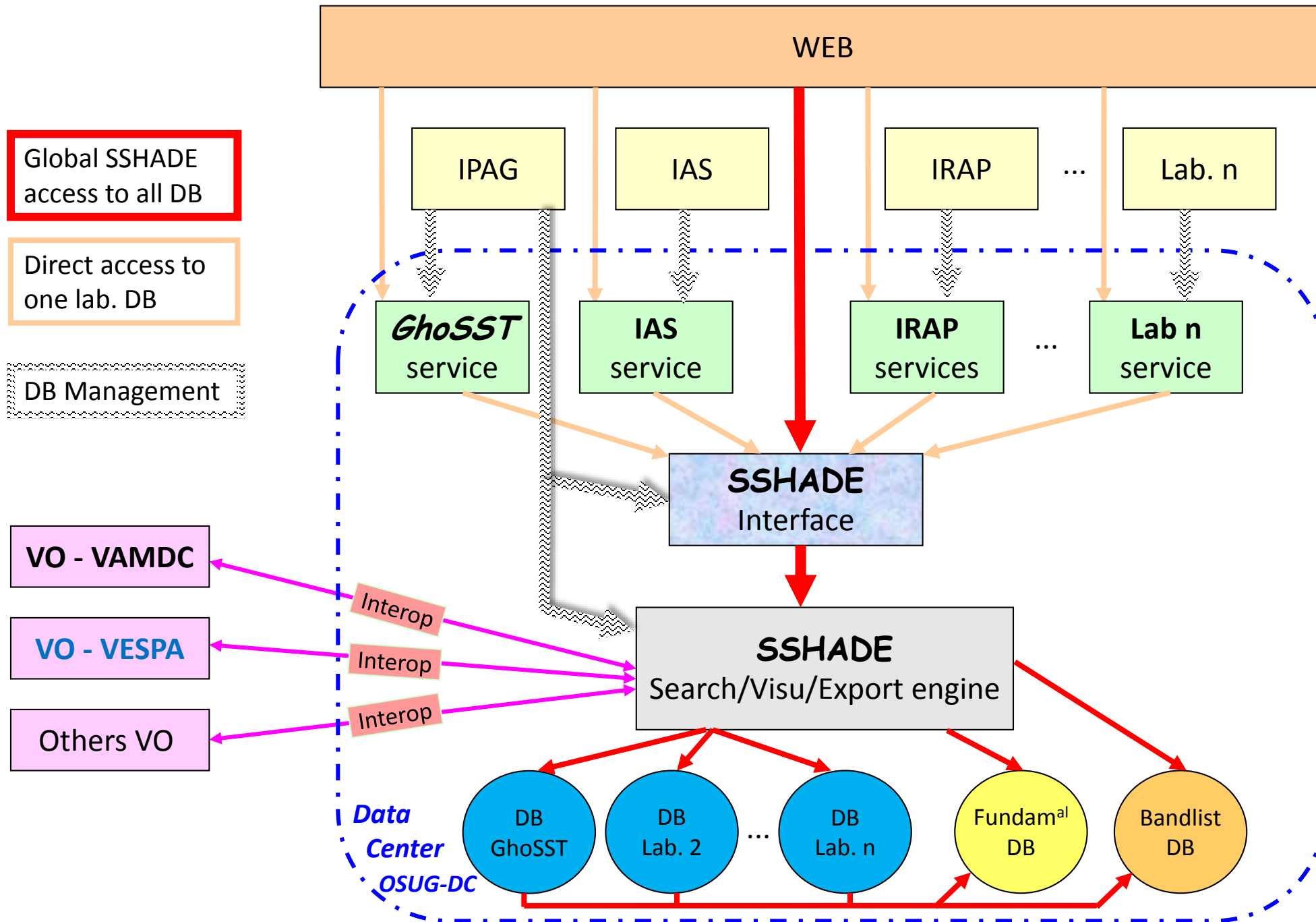
- **PIIM** (*GhoSST*)
 - MIR spectra of ices and organic molecules synthesized by VUV irradiation and chemical reactions
 - MIR spectra de molecules isolated in matrices.
- **LGL, ENS-Lyon**
 - Raman spectra of minerals and meteorites
- **Open University**
 - VUV spectra of ices
- **Univ. of Bern** (*BYPASS*)
 - multi-bands BRDF photometry of various materials: ices, organics, mixtures, ...
- **IAPS**
 - Spectra of meteorites, minerals, salts and rocks
- **AIU Observatory** (*DOCCD*)
 - optical constants of minerals
- **Centro de Astrobiología**
 - NIR-FIR spectra of ices ...
- **Instituto de Estructura de la Materia**
 - NIR-FIR spectra + optical constants of ices, organic molecules, phyllosilicates
- **Konkoly Astronomical Institute**
 - MIR spectra of meteorites and clay minerals
- **Planetary Geology Lab.** (*SOSYPOL*)
 - NIR-MIR spectra of volcanic rocks
- **Clay Mineral Laboratory** (*LSD*)
 - MIR spectra of meteorites and clay minerals
- **ESRF – Fame Line** (*FAME*)
 - X-Ray spectra of minerals, meteorites and various materials

Solid Spectroscopy data Infrastructure for European Data Providers: *SSHADÉ*

SSHADÉ :

“Solid Spectroscopy Hosting Architecture of Databases and Expertise”

- Based on the **GhoSST** database developments (Europlanet + VAMDC)
=> <http://ghosst.osug.fr>
- Made of:
 - ✓ A ‘solid spectroscopy’ interface
 - ✓ A Search/Visualization/Export engine
 - ✓ A set of databases: one per group (GhoSST is one of them)
 - ✓ A common fundamental database
- All hosted at OSUG data center (OSU Grenoble - UJF)
- SSHADÉ will be a service of others VO (Europlanet-VO, VAMDC, ...)



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JRA-5 Activities (WP 11)

JRA – SSHADE infrastructure development *(Philippe & Damien)*

Databases infrastructure

- Adaptation, extension & improvement of SSDM + implementation
- Creation of multi-database structure
- Development of SSHADE data import tools and parser
- Development of various conversion tools: units, files, bibtex, ...
- Automatic generation of DOI request

SSHADE interface

- Development of GUI for data producers: import, search, view data
- Development of user interface (search / view / export / tools / ...)
- Customization of interface for each database
- Interface and tools for easier data import

VO interoperability

- with VESPA-VO and VAMDC-VO

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VA2 Activities (WP 6)

VA – Database feeding

Coordination of consortium

- Animation of SSHADE consortium
- Development of the common ‘band list database’

Support to consortium

- 3 SSHADE consortium meetings
- Formation/training of scientific and database managers
- Preparation of documentations and tutorials for providers
- Technical support to adapt import files to each data set
- In-situ & on-line support to database managers
- Help feed data collected by the visitors of TNA on spectroscopic instruments

Support to users

- Tutorials & training for users at conferences
- Preparation of documentations and tutorials for users
- On-line support

State of the database managers training

SSHADE Team	DataBase	SSDM version
• IEM-CSIC, Madrid, E	?	v 5.6c
• AIU Observatory, Jena, D	DOCCD	v 5.7b
• WP-Unibe, Bern, CH	BYPASS	v 7.1a
• PIIM, Marseille, F	?	v 7.2
• IRAP (2), Toulouse, F	PaSSTEL	v 7.2
• ESRF, Grenoble, F	FAME	v 8.0
• IAS, Orsay, F	DAYSY	v 8.0
• LPGN, Nantes, F	SSTONE	v 8.0
• PGL/IGS-PAS, Wroclaw, PL	SOSYPOL	v 8.0b
• CML/IGS-PAS, Krakow, PL	LSD	v 8.0b
• IPAG, Grenoble, F	GhoSST	v 8.2

SSHADE-France = 7 groupes formés

Demande d'extension de labélisation

Base GhoSST → Infrastructure SSHADE-F

en juin 2017

Who do what

SSHADE management

- *Scientific Manager:* Bernard Schmitt (IPAG)
- *Software Manager:* Damien Albert (OSUG)

SSHADE development

- *Databases development:* Philippe Bollard (CDD @ IPAG)
- *VO interoperability:* Damien Albert (OSUG Data Center, Grenoble)
- *Databases storage:* " "

Data bases feeding

- *Consortium/users support:* Alexandre Garenne (CDD @ IPAG)
- *Fundamental data feeding* " "
- *Data validation, DB animation* Scientific Manager (one at each consortium group)
- *Data preparation & import* Database Manager (one at each consortium group)

SSHADA Time line

2015

- September
- December
- December

Start of Europlanet 2020-RI

Start of SSHADA development

Training database managers (session #1)

2016

- March
- June
- August
- November
- December

1st SSHADA meeting

Training database managers (session #2)

SSHADA prototype delivery

Training database managers (session #3)

Training database managers (session #4)

(D6.3 VAA VESPA – Y1)

(D11.5 JRA VESPA)

2017

- June
- June
- July
- August-Nov. ?
- September
- November
- December
- December

2nd SSHADA meeting

Training database managers (session #5)

6 databases ingested in SSHADA

SSHADA infrastructure

Training users EPSC (session #1)

9 databases ingested in SSHADA

Training users AGU (session #2)

Training database managers (session #6)

(D6.3 VAA VESPA – Y2)

(D11.7 JRA VESPA)

(D6.5 VAA VESPA)

SSHADA Time line

2018

- March Training database managers (session #7)
- April Training users EGU (session #3) (D6.5 VAA VESPA)
- June 12 databases ingested in SSHADA (D6.3 VAA VESPA – Y3)
- September Training users EPSC (session #4) (D6.5 VAA VESPA)
- October Training database managers (session #8)
- November 15 databases ingested in SSHADA

2019

- March 18 databases ingested in SSHADA
- March 3rd SSHADA meeting
- April Training users EGU (session #5) (D6.5 VAA VESPA)
- June 20 databases ingested in SSHADA
- August SSHADA with 18-20 databases (D6.3 VAA VESPA – Y4)
- August End of Europlanet 2020-RI