



# The IAA-CSIC SRC prototype

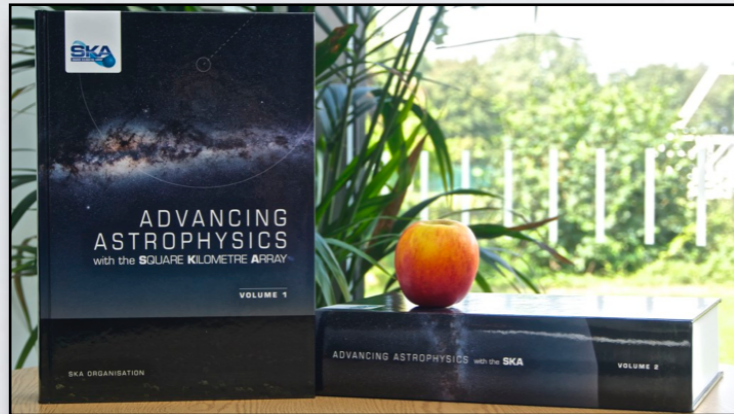
Susana Sánchez Expósito, Lourdes Verdes-Montenegro, Julián Garrido  
Instituto de Astrofísica de Andalucía - CSIC

AENEAS All-Hands meeting. 12th November. Utrecht



# SPANISH PARTICIPATION IN THE SKA - SCIENCE.

Publication in 2015 of the Spanish SKA White Book  
(**120 researchers from 40 centers**). [1]

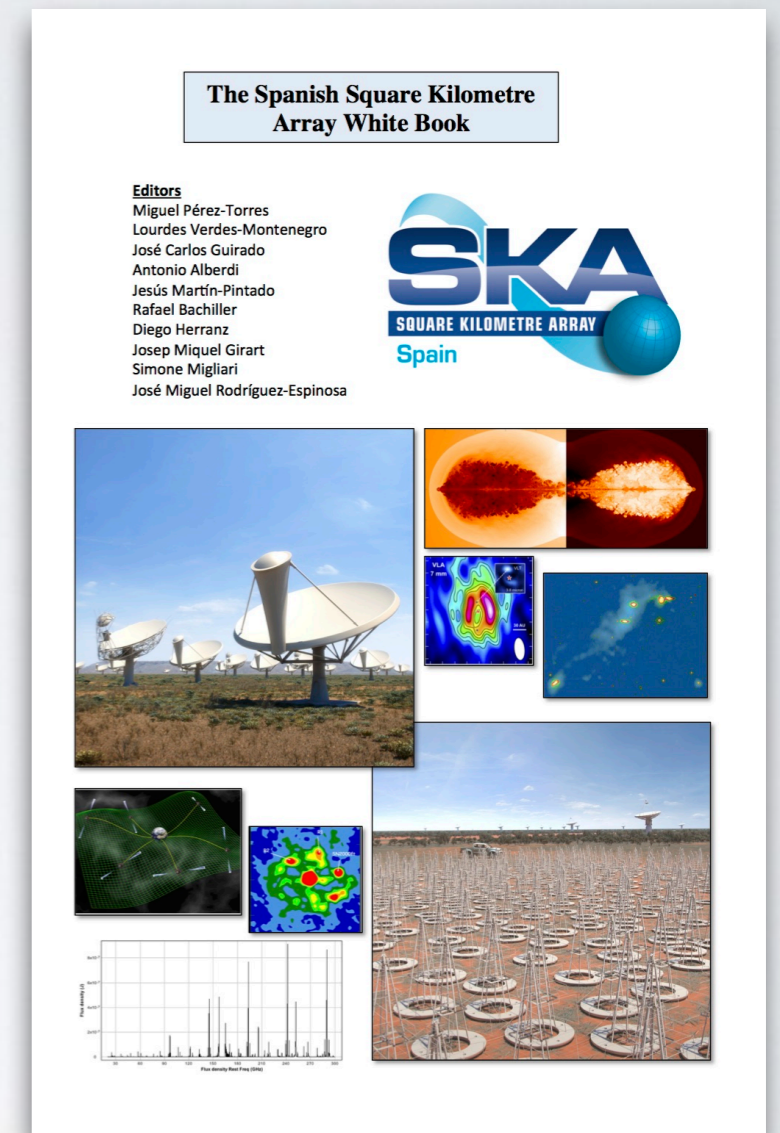


Contribution to > 14 chapters  
of the **SKA Science Book**  
“Advancing Astrophysics with  
the SKA (2015)”

- Cosmology
- Cradle of Life (**co -Chair: Izáskun Jiménez Serra**)
- HI Galaxy Science (**co-Chair: Lourdes Verdes-Montenegro**)
- Epoch of Re-ionization
- Extragalactic Continuum (galaxies/AGN, galaxy clusters)
- Gravitational Waves
- Magnetism
- Our Galaxy
- Pulsars
- Transients
- VLBI

## SKA Science Working Groups:

Currently, 37 researchers of 15 Spanish institutions participate in 11 out of the 13 SKA Science Working Groups. 2 co-Chairs.



[1]Download: <http://spain.skatelescope.org/ska-science/libro-blanco-ska/>



# IAA-CSIC COORDINATOR OF THE SPANISH PARTICIPATION IN THE SKA

## 2011- 2014 Feasibility study of the Spanish participation in the SKA

(Subprograma Infraestructuras Científicas Internacionales)

PI: L.Verdes-Montenegro (IAA-CSIC)

Diffusion and organisation of SKA activities in coord. with SKACON

- Support to organization of meetings
- Conferences in research centres
- Outreach: talks, Spanish SKA Web, ...

- Support to academic groups, industry and Ministry
  - Interaction with SKA Office & international stakeholders
  - Diffusion of funding calls and coordination of proposals
  - Support to the incorporation in SKA sci & tech committees
- **Industry capacity map**, preparation for procurement (collaboration with CDTI)

SKA in Spain meeting.  
10-11 June 2019 (Granada)

- 82 Participants
- 6 invited/plenary talks
- 10 contributed/plenary talks
- 3 parallel sessions

12 Spanish research centres + 12 companies participate in 8/12 SKA Design Consortia (~2 M€)

Spain joined SKA in June 2018



# PREPARATORY WORK: SCIENTIFIC EXPLOITATION OF SKA PRECURSORS/PATHFINDERS

## Northern hemisphere

**Jansky Very Large Array (JVLA, USA)**



**LOFAR (Europe)**



**e-Merlin (UK)**



**WSRT - Apertif (The Netherlands)**

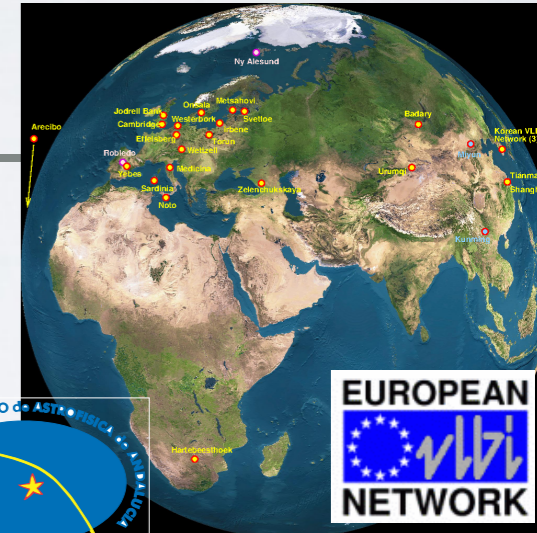


## Southern hemisphere

**MeerKAT (South Africa)**



**MWA (Australia)**



**ASKAP (Australia)**

**GMRT (India)**



# PROTO-SRC. LEVERAGING IAA EXPERTISE

- Radio-Astronomy
- e-Science and Open Science
  - Developments of **VO standards for radio data** (2009, IRAM-30m)
  - FP7 -“Advance **Workflow Preservation** Technologies for e-Science” (2010-2013)
  - Collaboration with IT centres for an efficient exploitation of **distributed computing infrastructures**
  - Calibration of **LOFAR ELAIS-N1 data in Amazon’s Cloud** (AWS & SKAO call) PI: J. Sabater (U. Edinburgh), 2015-2016
- Membership to
  - the SKA Science Data Processor Consortium (**SDP**)
  - the SKA Regional Centre Coordination Group (**SRCCG**)
  - the SKA Regional Centre Steering Committee (**SRCSC**)



# IAA PARTICIPATION IN PROJECTS RELATED TO SRCs



(H2020) Advanced European Network of E-Infrastructures for Astronomy with the SKA (2017-2019)

Design for a distributed European Science Data Centre (ESDC)



(iLink, CSIC) SKA-Link: combining knowledge to pioneer Big-Data solutions for SKA Data Centres. Coordinated by IAA-CSIC

Create a set of **best practices for SRCs** on the use of technologies that facilitate the **reproducibility**



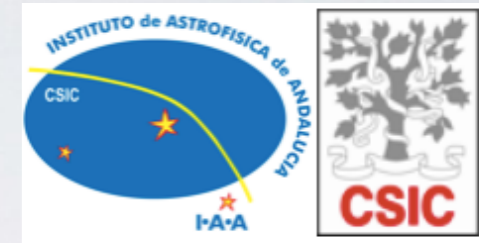
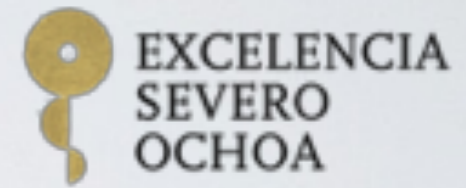
(H2020) European Science Cluster of Astronomy & Particle physics ESFRI research Infrastructures (2019-2022)

IAA contributes to WP5, in charge of creating a science platform that assists researchers in sharing of data and tools according to the FAIR principles.



## Severo Ochoa Grant

- Research Excellence Accreditation by the Spanish Ministry of Science
- A prototype of SRC fully engaged with Open Science, included in the IAA Severo Ochoa scientific programme
- A 4-years grant (2018-2022), renewable through a competitive call.



## Raising additional funds:

- For hardware:
  - ~600K€ (Severo Ochoa + National/Regional calls). Approved
- For personnel:
  - 1 FTE (2020-2022) (National call) Approved.
  - 1 FTE for 3 years (Regional call) Pending.





Lourdes Verdes-Montenegro  
**protoSRC coordinator**



Susana Sánchez  
**protoSRC technical responsible**



Julián Garrido  
**AENEAS**



Javier Moldón  
**Radioastronomer for providing user support**



Sebastián Luna  
**System administrator of the computing infrastructure**



Laura Darriba  
**Data Scientist for system documentation and support on ML**

## To be allocated ...

**Project Scientist**  
Active researcher acting as IAA preSRC advocator

**Postdoc**  
Open Science expert for developing the archive (VO compliant)

**Engineer**  
Software engineer for deploying OS services and science domain tools on the preSRC



# OBJECTIVES OF THE PROTO-SRC@IAA

Perform the first steps to be accredited as a SRC

Strengthen scientific activities related to SKA and its precursors

Embrace Open Science

Transversality/wavelength agnostic

# REQUIREMENTS FOR THE PROTO-SRC@IAA

Proto-SRC@IAA

SRC@IAA

GOALS vs REQS.

Reqs. From use cases associated to IAA Participation in SKA precursors LPs

Reqs. From use cases associated to Spanish community participation in SKA precursors LPs

Special effort to prioritize as well needs that are particularly transversal

Reqs. In terms of computing/storage capacity and tools to support Spanish community in Open Science



## » Partnership with national computing facilities

- » Previous collaborations with BSC, FCSC
- » Contact with U. of Málaga (Spanish Supercomputing Network)
- » Contact with IFCA (Supercomputing Spanish Network and IBERGRID node)
- » Participation in the Spanish Network on Open e-Science.  
(RED2018-102377-T)



## » Collaboration on SRC prototyping activities

- » Collaboration agreement signed with IDIA
- » Participating in the Pilot demonstration of a SA-EU federated cloud.



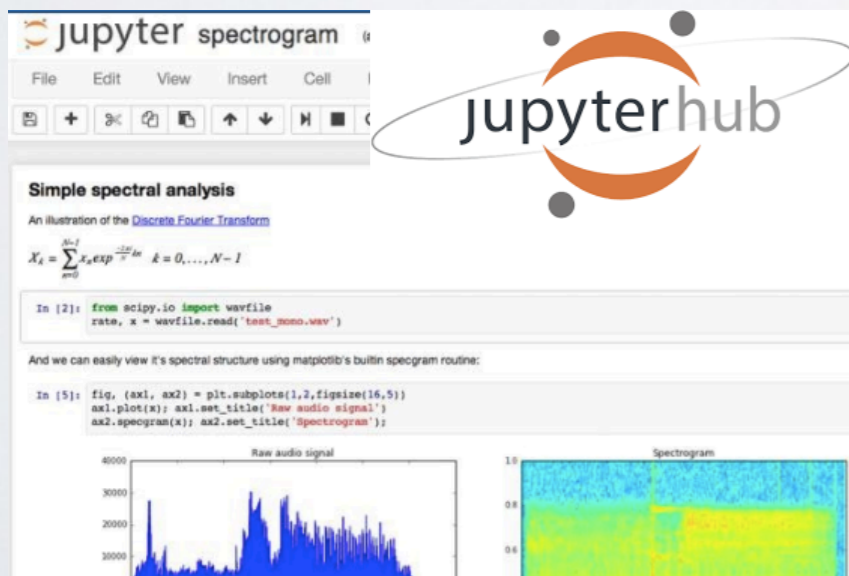
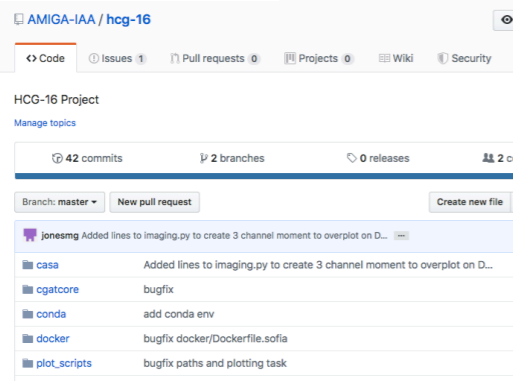
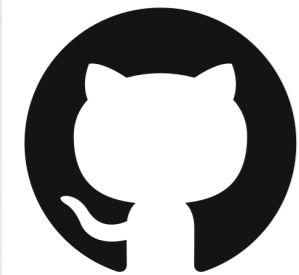
## Special focus on addressing the challenge of handling SKA data to extract scientific knowledge in a **reproducible way**

Identification of Open Science tools to support community with

- » Exposing their research / increasing its visibility
- » Sharing data / tools following open science standards (e.g VO)
- » Re-use of tools (methods) by the same team, other teams, and repurpose
- » Enhancing collaboration with other teams



marketplace Explore



See talk on Wednesday "Open Science and collaborative approach for users" by Julian Garrido



## Connected with the international SRC prototype activities/SRC Steering Committee:

- Be **part of the first global prototype SRC network** and of **EOSC** at European level
- Provide a **collaborative** software platform that can **interoperate among SRCs**
- Access through **IVOA** services - SRC data will be IVOA compliant
- Be a **wavelength agnostic** facility
- Provide **tools for reuse** of SKA data products (multi-messenger, multi-wavelength)
- **Share infrastructure** with other disciplines

THANKS!



