MONDAY – SESSION 1

ASTROPHYSICAL DATA VISUALIZATION FROM LINE PLOTS TO AUGMENTED AND VIRTUAL REALITY

<u>Invited and Contributed</u>

08.40 – 09.05   Amitabh Varshney (Univ. of Maryland)
Astronomy-inspired Visual Computing

09.05 – 09.35   Brian Kent (NRAO)
3D Data Visualization in Astrophysics

09.35 – 09.50   Christopher Zapart (NAOJ)
An introduction to FITSWebQL

09.50 – 10.05   Angus Comrie (Univ. of Cape Town)
An HDF5 Schema for SKA Scale Image Cube Visualization

10.05 – 10.20   Emanuel Ramirez (Quasar Science Resources)
Analysis of Astronomical Data using VR: the Gaia catalogue in 3D

<u>Focus Demo</u>

10.45 – 11.15   Alexandar Mechev (Leiden University)
Building LOFAR As A Service: Processing Petabytes with just a click

MONDAY – SESSION 2

ALGORITHMS

Invited and Contributed

11.15 – 11.45   James Bosch (Princeton U./LSST)
An Overview of the LSST Image Processing Pipelines

11.45 – 12.00   Amanda Kepley (NRAO)
Auto-multithresh: A General Purpose Automated Masking Algorithm for Clean

12.00 – 12.15   Daniele Tavagnacco (INAF-OATs)
Performance-related aspects in the Big Data Astronomy Era: architects in software optimization

12.15 – 12.30   Lightning Talks

MONDAY – SESSION 3

QUALITY ASSURANCE OF SCIENCE DATA

Invited and Contributed

14.00 – 14.15   Nadia Dencheva (STScI)
GWCS - A General Approach to Astronomical World Coordinates

14.15 – 14.30   Cheuk Yin Lam (Liverpool Telescope)
Data-Driven Pixelisation with Voronoi Tessellation

14.30 – 15.00   Ray Plante (NIST)
The BagIt Packaging Standard for Interoperability and Preservation

Focus Demo

15.30 – 16.00   Michael Raddick (Johns Hopkins U.)
SciServer: Collabroative data-driven science

MONDAY – SESSION 4

QUALITY ASSURANCE OF SCIENCE DATA (CONTINUED)

Invited and Contributed

16.00 – 16.15   Rosa Diaz (STScI)
Adding Science Validation to the JWST Calibration Pipeline.

16.15 – 16.30   Gilles Landais (CDS/ObAS)
Quality assurance in the ingestion of data into the CDS VizieR catalogue and data services

16.30 – 16.45   Franois Bonnarel (CDS/ObAS)
ProvTAP: A TAP service for providing IVOA provenance metadata

16.45 – 17.00   Lightning Talks

Birds of Feather

SALON AB
17.15 – 18.15   Jessica Mink (CfA)
Data Formats

18.15 – 19.15   August Muench (AAS)
Data Citation: from Archives to Science Platforms

SALON G
17.15 – 18.15   Eric Tollerud (STScI)
Open Source/Development Software Projects and Large Organizations/Missions: Recommendations and Challenges

18.15 – 19.15   Kai Polsterer (HITS)
Beginners Guide to Machine Learning in Astronomy

TUESDAY – SESSION 5

DATABASES AND ARCHIVES: CHALLENGES AND SOLUTIONS IN THE BIG DATA ERA

Invited and Contributed

09.00 – 09.30   Felix Stoehr (ESO/ALMA)
Astronomical archives: Serving up the Universe

09.30 – 09.45   Clara Brasseur (STScI)
AstroCut: A cutout service for TESS full-frame image sets

09.45 – 10.00   Petar Zecevic (Univ. of Zagreb)
AXS: Making end-user petascale analyses possible, scalable, and usable

10.00 – 10.15   Nicolas Buchschacher (Univ. of Geneva)
No-SQL databases: An efficient way to store and query heterogeneous astronomical data in DACE.

Focus Demo

10.45 – 11.15   Emmanuel Joliet (IPAC/Caltech)
Visualization in IRSA Services using Firefly

TUESDAY – SESSION 6

DATA SCIENCE: WORKFLOWS, HARDWARE, SOFTWARE, HUMANWARE

Invited and Contributed

11.15 – 11.45   Kirk Borne (Booz Allen Hamilton)
Massive Data Exploration in Astronomy: What Does Cognitive Have To Do With It?

11.45 – 12.00   Ignacio Toledo (Joint ALMA Observatory)
Data Science =! Software Engineering. Exploring a workflow for ALMA operations.

12.00 – 12.15   Takeshi Nakazato (NAOJ)
New Synthesis Imaging Tool for ALMA based on the Sparse Modeling

12.15 – 12.30   Lightning Talks

TUESDAY – SESSION 7

MACHINE LEARNING IN ASTRONOMY

Invited and Contributed

14.00 – 14.30   Maggie Lieu (ESA)
Deep learning of astronomical features with big data.

14.30 – 14.45   Megan Ansdell (UC Berkeley)
Automatic Classification of Planet Candidates using Deep Learning

14.45 – 15.00   Bojan Nikolic (Univ. of Cambridge)
Acceleration of Non-Linear Minimisation with PyTorch

Focus Demo

15.30 – 16.00   John Good (Caltech/IPAC-NExScI)
Image Processing in Python With Montage

TUESDAY – SESSION 8

MULTI-MESSENGER ASTRONOMY

Invited and Contributed

16.00 – 16.15   Sankalp Gilda (Carnegie Mellon University)
Importance of Feature Selection in ML models

16.15 – 16.30   Cong Dai (Beijing Normal University)
TBD

16.30 – 17.00   Erik Kuulkers (European Space Agency)
Coordinating observations among ground and space-based telescopes in the multi-messenger era

Birds of Feather

SALON AB
17.15 – 18.15   Simon O'Toole (AAO-MQ)
How do you get the most out of your teams?

SALON G
17.15 – 18.15   Peter Shawhan (Univ. of Maryland)
Data analysis challenges for multi-messenger astrophysics

WEDNESDAY – SESSION 9

DATABASES AND ARCHIVES (CONTINUED)

Invited and Contributed

09.00 – 09.15   Beatriz Martinez (Rhea Systems S.A.)
Data-driven Space Science at ESA Science Data Centre

09.15 – 09.30   Simon O'Toole (AAO-MQ)
Bringing together the Australian sky - coordination and interoperability challenges of the All-Sky Virtual Observatory

09.30 – 09.45   Juan Gonzalez-Nuñez (European Space Agency)
Driving Gaia Science from the ESA Archive: DR2 to DR3

09.45 – 10.00   Sarah Graves (East Asian Observatory)
Harnessing the power of archival data to increase scientific output: the JCMT experience.

10.00 – 10.15   Alice Allen (Astrophysics Source Code Libr)
Toward common solutions for data access, discovery and interoperability

Focus Demo

10.45 – 11.15   Karan Vahi (Pegasus Team - USC/ISI)
Workflows Management using Pegasus

WEDNESDAY – SESSION 10

TIME DOMAIN ASTRONOMY

Invited and Contributed

11.15 – 11.30   Hackathon Prizewinner

11.30 – 12.00   Ada Nebot (CDS/ObAS)
Data challenges of the VO in Time Domain Astronomy

12.00 – 12.15   Mario Juric (Univ. of Washington)
The ZTF Alert Stream: Lessons from the first six months of operating an LSST precursor

12.15 – 12.30   Lightning Talks

WEDNESDAY – SESSION 11

SOFTWARE FOR SOLAR SYSTEM ASTRONOMY

Invited and Contributed

14.00 – 14.30   Matthew Holman (CfA)
The Minor Planet Center Data Processing System

14.30 – 14.45   Elena Racero (ESAC - Serco)
ESASky: A New Window for Solar System Data Exploration

14.45 – 15.00   Anne Raugh (Univ. of Maryland)
The PDS Approach to Science Data Quality Assurance

WEDNESDAY – SESSION 12

SCIENCE PLATFORMS: TOOLS FOR DATA DISCOVERY AND ANALYSIS FROM DIFFERENT ANGLES

<u>Invited and Contributed</u>

16.00 – 16.30   Ivelina Momcheva (STScI)
Hubble in the Cloud: A Prototype of a Science Platform at STScI

16.30 – 16.45   Michael Fitzpatrick (NOAO)
The NOAO Data Lab: Design, Capabilities and Community Development

16.45 – 17.00   Tom Donaldson (STScI)
Astropy and the Virtual Observatory

<u>Birds of Feather</u>

SALON AB
17.15 – 18.15   Alice Allen (Astrophysics Source Code Libr)
Unconference Session: I want to talk about...

THURSDAY – SESSION 13

DEVOPS PRACTICES IS ASTRONOMY SOFTWARE

Invited and Contributed

09.00 – 09.30   Rocio Guerra Noguero (European Space Agency)
DevOps: the perfect ally for Science Operations for a large and distributed astronomy project.

09.30 – 09.45   Marcel Loose (ASTRON)
Agile and DevOps from the trenches at ASTRON

09.45 – 10.00   Jeffrey Smith (SETI Institute)
Lilith: A Versatile Instrument and All-Sky Simulator for use with Space-Based Astrophysics Observatories

10.00 – 10.15   Malik Olivier Boussejra (Keio Univ.)
aflak: Pluggable Visual Programming Environment with Quick Feedback Loop Tuned for Multi-Spectral Astrophysical Observations

THURSDAY – SESSION 14

MANAGEMENT OF LARGE SCIENCE PROJECTS

Invited and Contributed

11.15 – 11.45   Michael Wise (ASTRON)
Establishing the SKA Regional Centre Network: Mesh Management and Culture Change

11.45 – 12.00   Anastasia Alexov (STScI)
Hit the Ground Running: Data Management for JWST

12.00 – 12.15   Maurizio Tomasi (Univ. degli Studi di Milano)
Towards new solutions for scientific computing: the case of Julia

12.15 – 12.30   BOF Lightning Summaries