VERY LARGE ARRAY SKY SURVEY

Introduction

Stefi Baum, University of Manitoba

Galactic Center (Survey) Multiwavelength Image
Credit: X-ray: NASA/UMass/D.Wang et al., Radio: N
RAO/AUI/NSF/NRL/N.Kassim, Mid-Infrared: MSX

VLASS – Why Now?

- Over 20 years since NVSS and FIRST.
  - Data from those surveys extremely well utilized by the broad astronomical community and still delivering high quality science.
- The VLA was updated to the JVLA for a reason.
  - OTF mosaics, wide fractional bandwidths for increased continuum sensitivity, instantaneous spectral index determination, full polarization
- In the past 20 and future 10 years there are/will be All-sky surveys in many wavelengths.
  - NRAO has lagged in its involvement in “multi-messenger” astronomy – surveys allow all astronomers to get at the physics.
- Establish the baseline for time domain.

The VLA Sky Survey Initiative

- July 2013 – NRAO announces it will consider new JVLA sky survey
  - Science and Survey Definition to be led by community
  - Open international participation, public data and products

- NRAO role
  - to facilitate,
  - lead technical capability definition and associated tests,
  - implement if approved,
  - deliver basic data products,
  - support community generation of higher level data products,
  - Support education and public outreach

science.nrao.edu/science/surveys/vlass

The VLA Sky Survey Initiative**

- Day Workshop Planned for AAS Meeting January 2014
- Nominations solicited from Community for Science Organizing Committee, chaired by Stefi Baum, selected by Tony Beasley
- White papers solicited in advance of Workshop, posted.
  - Science goals, survey designs, implementation plans
  - 22 papers received, with ~200 coauthors
- Very well attended, lively discussions.
  - Clear Imperative to continue.

White Paper Highlights - Science

- Medium/Deep Fields for Galaxy Evolution and Cosmology
  - Brown et al., Mao et al., Spoalor et al., Clarke et al.
  - AGN, Clusters, Feedback/Star-Forming Gals/Weak Lensing
- Large Area Survey for Transients and Faraday Tomography
  - Chatterjee et al, Hallinan et al, Kamble et al, Law et al, Wilson et al
  - Magnetic field/EM Counterparts to GW, radio bursts 1ms to > 1year
- Galactic Plan and Center
  - Bastian et al., Bhatnagar et al., Sjouwerman et al., Mills et al.
  - Atomic and Molecular Lines, .2-50/Stars and Stellar Systems

Our of the Workshop – the SSG**

- Co-Chairs - Eric Murphy and Stefi Baum

- Working Group Co-Chairs
  - Programmatic: Jim Condon (NRAO), Rick White (STScI)
  - Extragalactic: Gordon Richards (Drexel), Jackie Hodge (NRAO)
  - Galactic*: Rachel Osten (STScI), Joe Lazio (JPL)
  - Transients: Gregg Hallinan (Caltech), Ashley Zauderer (CfA)
  - Technical: Casey Law (UC Berkeley), Steve Myers (NRAO)
  - Outreach: Susana Deustua (STScI), Nicole Gugliucci (SIUE/ CosmoQuest)

- At-Large Councilors:
  - Niel Brandt (Penn State), Jim Cordes (Cornell),
  - Mark Dickinson (NOAO), Tracy Clarke (NRL), Sui Ann Mao (MPIA), Michael Strauss (Princeton)

* Ex-Galactic Co-Chair: Cornelia Lang (U Iowa)

Intensive Community Effort – 1.5 years**

- 22 White Papers carrying ~180 ***unique*** authors
  - ~**20%** who were not in the NRAO database
- Extensive discussion - public working group web/boards.
- Many extremely active contributors. Heavy hitters include:
  - Michael Brown, Shami Chatterjee, Laura Chomiuk, Ian Heywood, Matt Jarvis, Mark Lacy, Tom Maccarone, Betsy Mills, Kunal Mooley, Larry Rudnick, Greg Sivakoff, Lorant Sjouwerman, Russ Taylor

Despite having day jobs

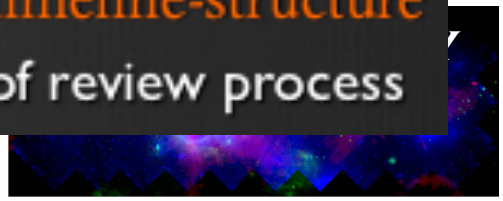
The Entire Process Has Been Entirely Voluntary on the part of the SSG and the engaged community at large.

VLASS Schedule**

Date	Activity
2013 September	Call for White Papers
2014 January	VLASS Planning Workshop
2014 February	SSG convened
2014 March – June	SSG finalizes science definition
2014 October 15	Proposal submitted for internal review
2014 Oct. 15 – Dec. 1	NRAO Internal Review
2015 January 15	Final proposal posted for community comment
2015 February 15	Community commenting closed (for Community Review)
2015 March 4 – 6	External Community Review (Socorro)
2016 Spring –	VLASS observations commence*

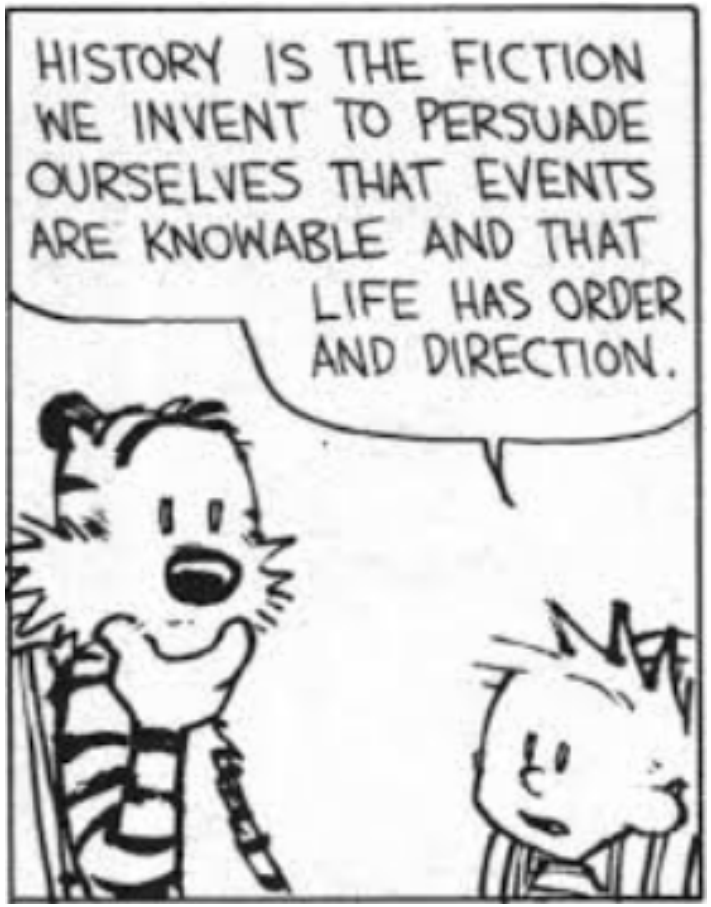
https://science.nrao.edu/science/surveys/vlass/timeline-structure

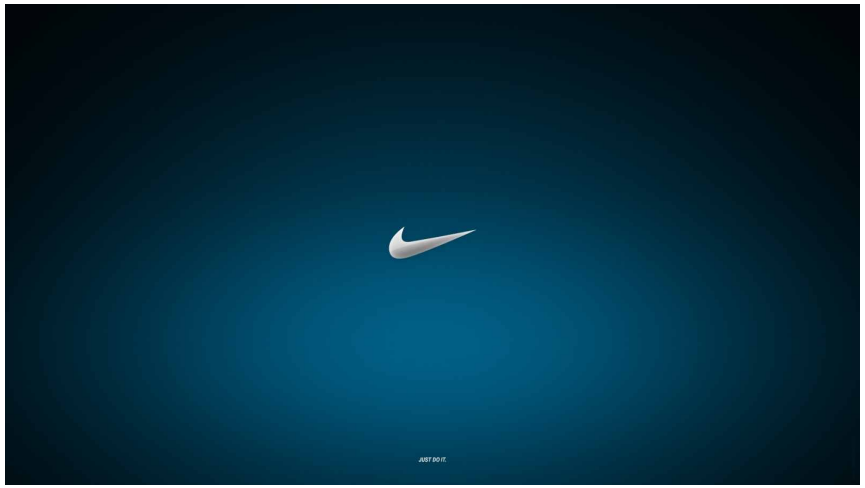
*Pending outcome of review process



VLASS – The Message You Should Hear**

- A new era of wide-area high-resolution radio synoptic surveys is about to begin.
- The JVLA with its unique scientific capabilities has unique scientific contributions to make.
- VLASS should be at the heart of that future so that the US+ community can be at the heart of the discoveries it will drive.
- There is no single perfect survey. Smart people will always have differing viewpoints on details, but this is an awfully good survey that will deliver standout science.
- VLASS was developed by the community for the community
  - ***Radio, mm, IR, Optical, UV, X-Ray,***
  - ***Gamma-Ray, GR, the public.***


HISTORY IS THE FICTION WE INVENT TO PERSUADE OURSELVES THAT EVENTS ARE KNOWABLE AND THAT LIFE HAS ORDER AND DIRECTION.




VLA SKY SURVEY