The Debian Astro project

A Debian Pure Blend for astronomy and astrophysics

Ole Streicher

olebole@debian.org

Zeuthen, 2018-02-13

Leibniz Institute for
Astrophysics Potsdam

debian
astronomy

Debian GNU/Linux

- Free Linux based operating system
- One of the oldest distributions (founded 1993)
- **Free** as in "Free Speech"
- Base: Social Contract; Debian Free Software Guidelines
- $>$ 50.000 software packages
- $>$ 1.000 official developers
- Base for many derivatives: Ubuntu, Mint, ...
- Current stable version: Debian 9 (Stretch), since June 2017

debian
astronomy

The Debian Astro Pure Blend

- *Blended tea*: a combination of different kinds of teas to guarantee consistent quality (Wikipedia)
- Method to organize Debian astronomy packages
  - currently 294 packages, (more in preparation)
  - 19 metapackages
  - Web page, "tasks" pages
  - Handle citations, ASCL entries
- Completely integrated into Debian (*Pure*)
- First release with Debian Stretch (June 2017)

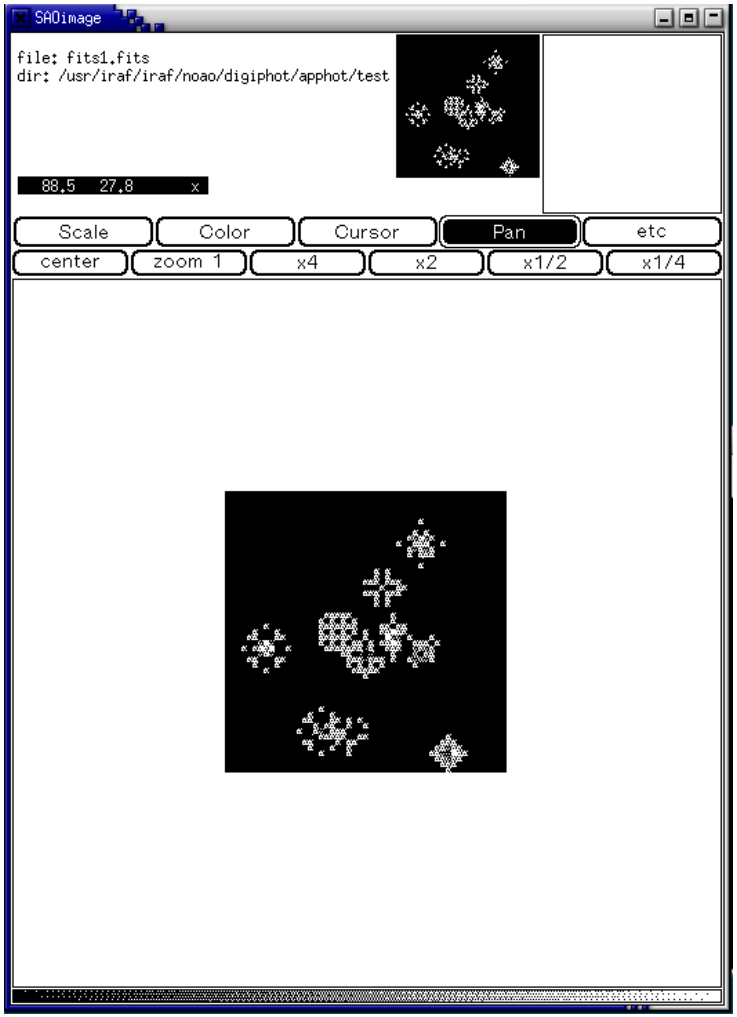
debian
astronomy

Debian Pure Blends

- **Debian Astro** - Astronomy and astrophysics
- **Debian GIS** - Geographical Information Systems
- **DebiChem** - Chemistry
- **Debian Med** - Strong focus on Microbiology
- **NeuroDebian** - Neuroscience
- **Debian Science** - "Umbrella" blend for sciences
- **Debian Edu** - Education of all kind
- Debian Games, Debian Junior, Debian Multimedia, Hamradio, ...

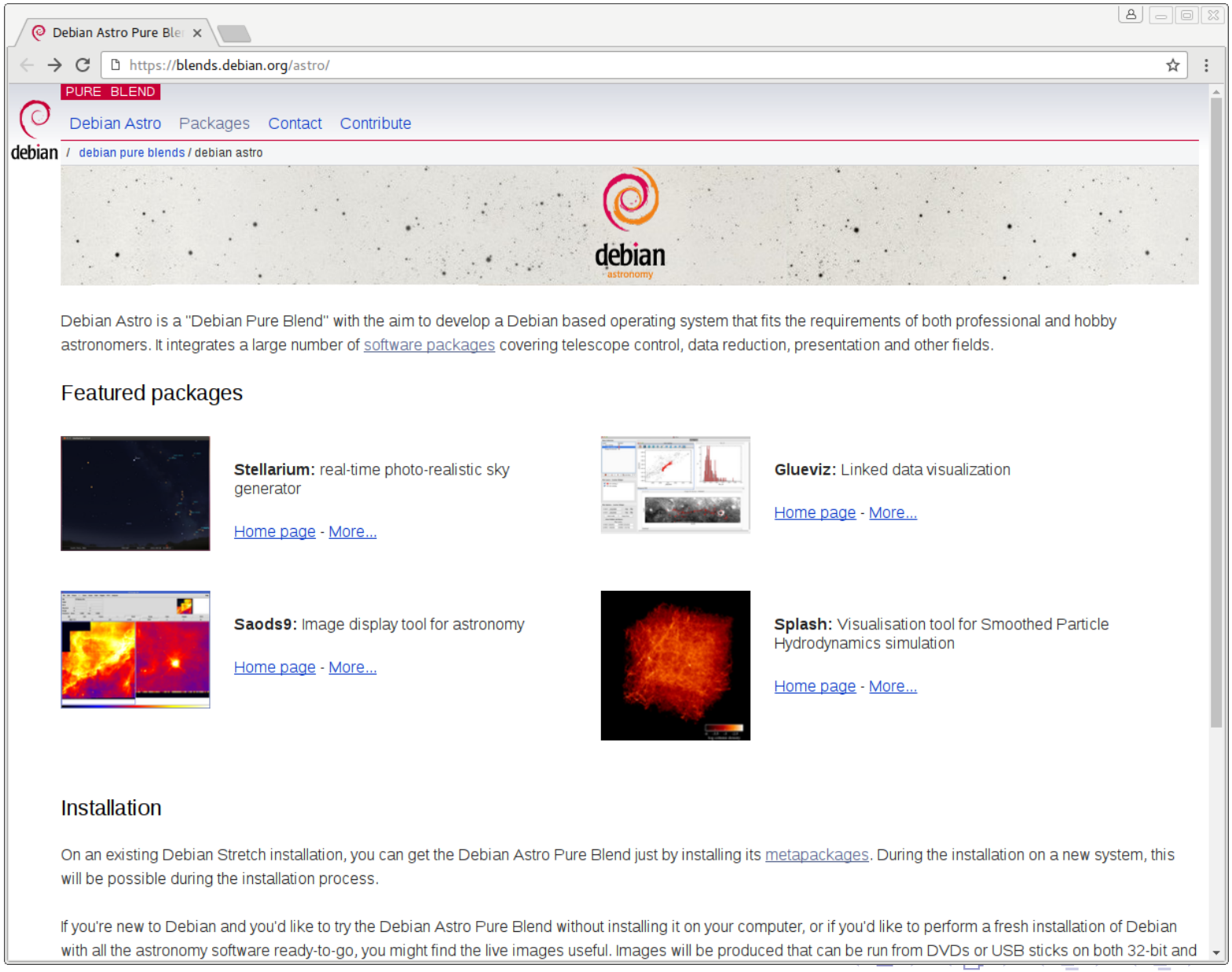
debian
astronomy

History of Debian Astro

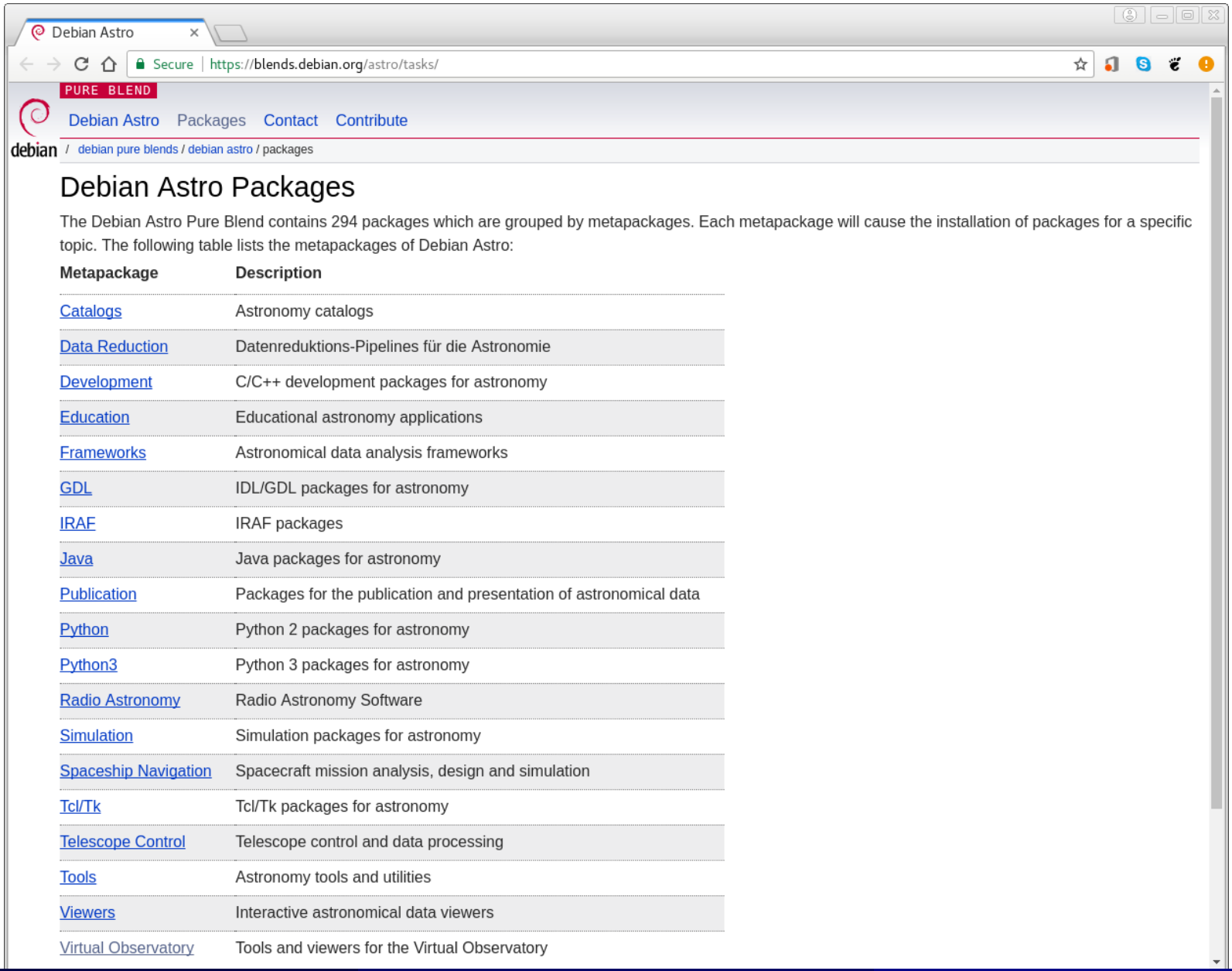


- First packages: saoimage (1999), cfitsio (2000), iraf (2000), sextractor (2002), pyfits (2006)
- After 2006, many packages got unmaintained; bitrot, partial removal
- 2014 start with mailing list and alioth project
- 2016 official announcement of the Debian Astro Pure Blend
- 2017 First release
- Logo created by Maria Hammerstrom

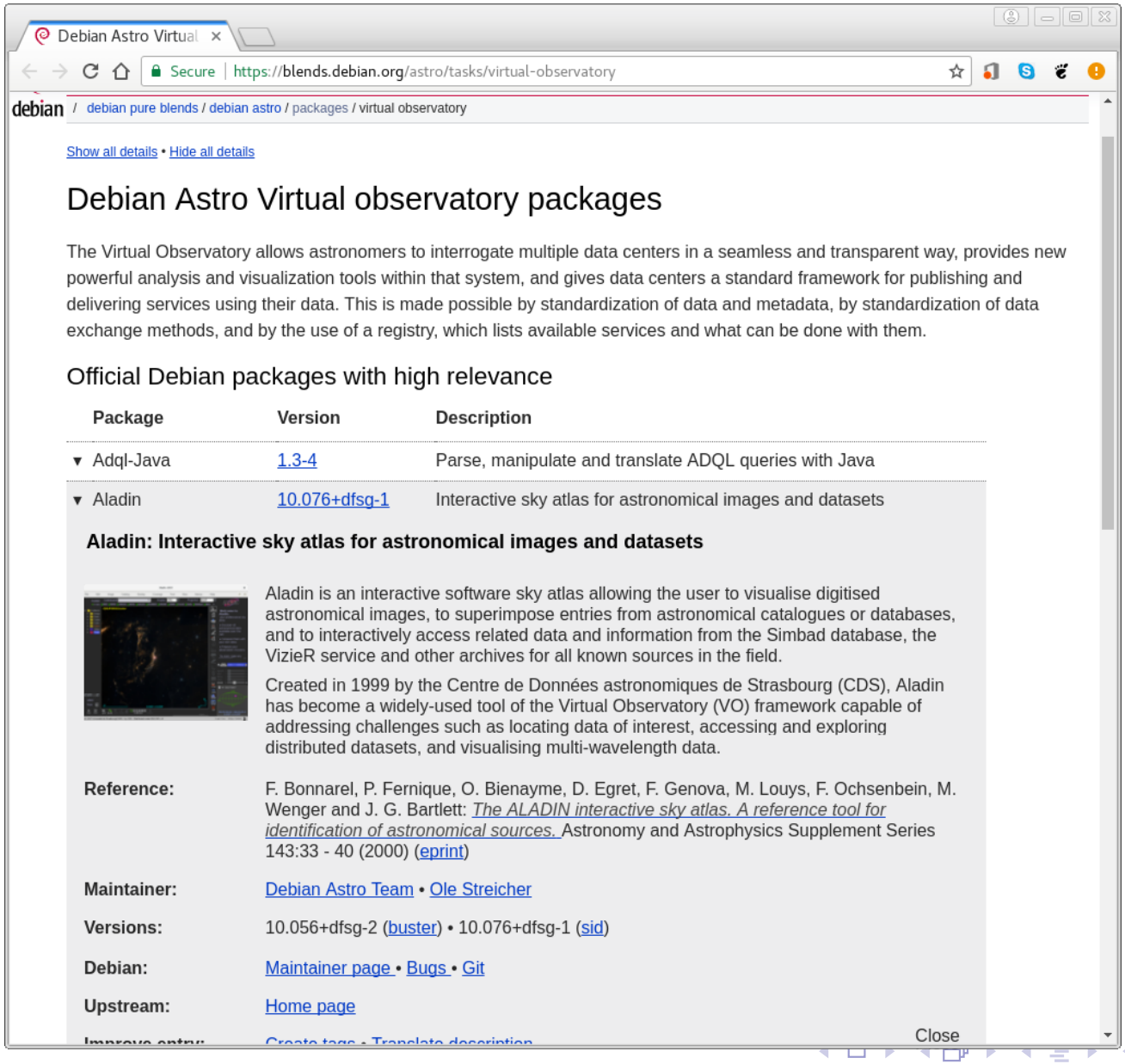
Debian Astro Web Pages



Debian Astro Web Pages



Debian Astro Web pages



Debian Astro Pure Blend Base libraries

- cfitsio, ccfits, qfits
- wcslib
- wcstools
- ESO cpl
- Starlink AST, PAL, Java
- healpix (C, C++, Python)
- erfa (SOFA), giza (PGPLOT)
- casacore
- selected common science packages: fft, cminpack etc.

Debian Astro Pure Blend Contents

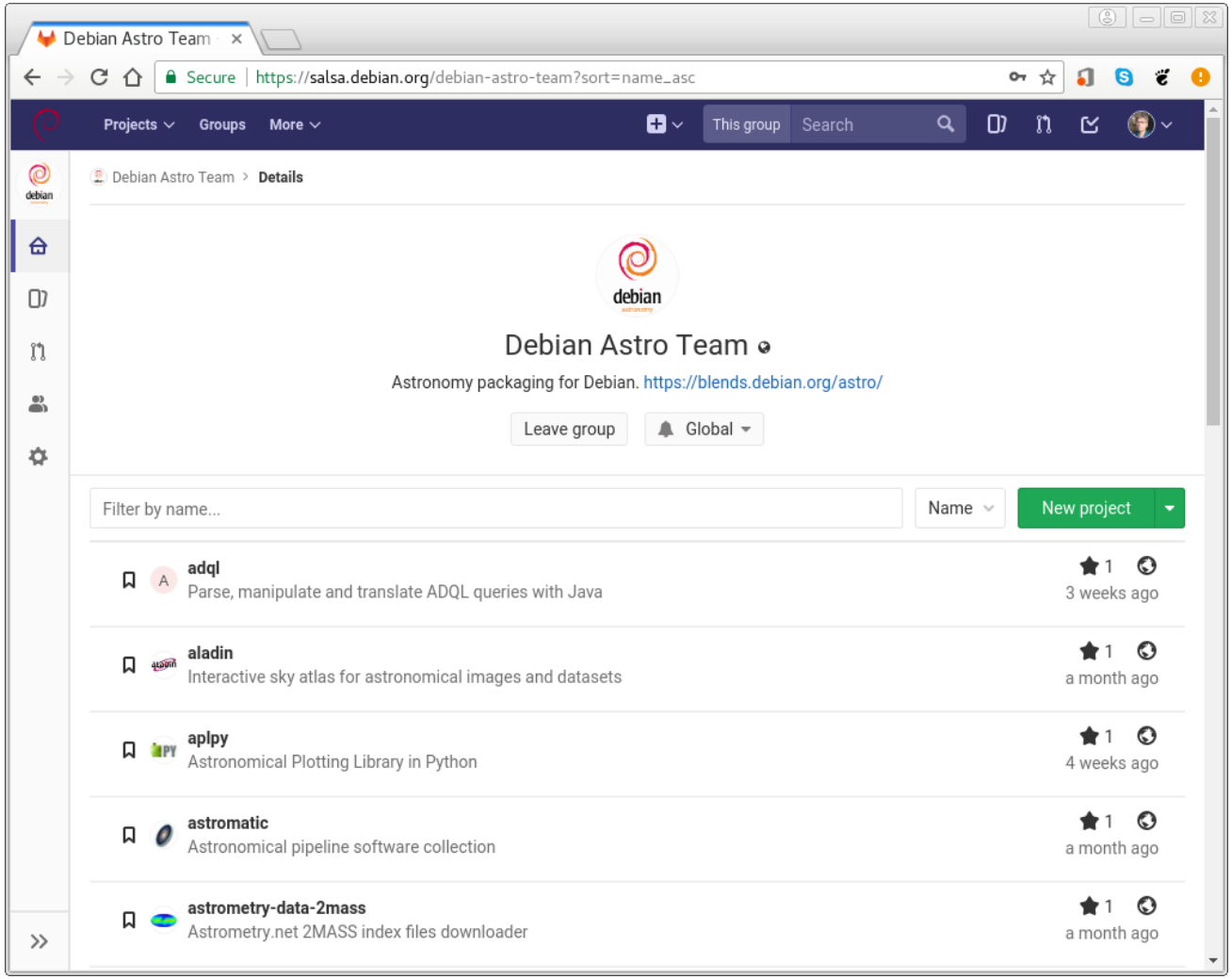
- Python
  - Astropy
  - affiliated packages
- "Legacy"
  - IRAF, PyRAF
  - ESO-MIDAS
  - Tcl/Tk (DS9, fv, skycat)
  - GDL (IDL replacement)
- Java/Virtual Observatory
  - Aladin
  - Topcat
- Radio Astronomy
  - cassbeam, wsclean, ...
- much more (education, publication, amateurs, ...)

The Debian Astro Team

- Mailing list: 170 subscribers
- Team members
  - total: 45
  - uploaders: 13
- Team maintained source packages: 155
- Git repositories in a central space (salsa.debian.org)
- Most packages have only one maintainer
- Some package not maintained by the Debian Astro team
  - educational
  - publishing
  - general physics, data analysis etc.

debian
astronomy

Debian Astro Development Server



debian
astronomy

Advantages for Public Packaging: Technical

- Testing:
  - install tests on 23 platforms (10 official, 13 inofficial)
  - regular integration tests (on each depedency change)
  - repeated “inofficial” install tests (Reproducible builds)
  - people doing research with software metrics
  - bug tracker is already there
- Coupled to distribution development
- Dependencies are recognized
  - automated “transitions” (recompilations) when ABI breaks
  - prevent from silent removal of dependencies
- Automatic migration to Ubuntu

debian
astronomy

Advantages for Public Packaging: Social

- Self-magnification: a strong Debian Astro Pure Blend will attract more people to contribute
- Others may contribute to your package: bugfixes etc.
- Debian is “bazaar” style: everyone can follow, everyone can contribute, development is transparent
- Packages may get some attention even if “orphaned”
  - Team uploads
  - Non-maintainer uploads (NMU)
  - QA team
  - package adoption
- Coordinate / Avoid duplication of development efforts

debian
astronomy

Debian as a Reference Platform

- Almost standard linux
- High quality standards
- Clear, consistent structure: comprehensive Debian policy, specific policies for different fields: Python, Java, Tcl/Tk, Science
- Lots of tools for packaging + package checks
- Patches from Debian often migrate upstream or “side stream” (to Macports, Fedora, ...)

debian
astronomy

Packaging Rules, “Policy”

- Social Contract + Debian Free Software Guidelines: strict rules
- Debian policy
  - completely build from source
  - no convenience copies of code; re-use existing libraries
  - recursive packaging (package dependencies first, ...)
  - file system standard
  - package names, ...
- Specific policies (Python, Java, Tcl/Tk, Science)
- Portability (10 official architectures)
  - 32 vs. 64 bit
  - byte order
- Team maintenance

debian
astronomy

Comparison to other approaches

	Debian Astro	Fedora Astronomy	STScI AstroConda	ESO SciSoft
Release year	2017	2016	2016	2014
Operating System	Linux+	Linux	Linux,Mac	Linux
Binary Packages	250	73	75	102
Integrated in OS	yes	yes	no	no
Install as Non-root	no	no	yes	no
All sources available	yes	yes	partly	no
CI tests	yes	no	no	no
Mailing list	yes	yes	yes	no
Bug tracker	yes	yes	(yes)	no

debian
astronomy

Older Debian releases

- Stable version: package versions fixed after distribution release
  - currently Debian 9, “Stretch”
  - updates: Only bug fixes, no new versions
- Backports
  - new versions
  - no automated backporting, need to be maintained
- Ubuntu: similar, but needs extra approval
- No specific workflow in Debian Astro yet
  - may be adopted from NeuroDebian
  - first steps recently with Astropy

debian
astronomy

Problems and surprises

- Licensing
  - unclear or unspecified license from upstream
  - files or code copied from somewhere else
  - “stolen” code: Numerical Recipes
- Dependencies and convenience copies
  - non-free
    - try free replacement: IDL → GDL, PGPLOT → giza
    - package for “contrib” area
  - not packaged yet → packaging of dependency needed
  - outdated: try to migrate to latest version
  - local changes: discuss with upstream

debian
astronomy

Data files

- Origin often unclear
- License often unclear or restrictive
- Large package size
- Often impossible to create from a “source”
- Possible solutions:
  - Discuss with upstream and on the debian-astro mailing list
  - Try harder ;-)
  - Download during install: package must go to contrib
  - Package in non-free

debian
astronomy

Pointers

- Policy: `https://www.debian.org/doc/debian-policy`
- Developers Reference:
  `https://www.debian.org/doc/manuals/developers-reference`
- Web page: `https://blends.debian.org/astro`
- Mailing lists:
  - Astro: `https://lists.debian.org/debian-astro`
  - Python: `https://lists.debian.org/debian-mentors`
  - Mentors: `https://lists.debian.org/debian-mentors`
  - Common development: `https://lists.debian.org/debian-devel`
- Salsa project; Git repositories:
  `https://salsa.debian.org/debian-astro-team`
- IRC: `irc://irc.debian.org/debian-astro`

debian
astronomy

Thank you

debian
astronomy

olebole@debian.org

Debian Astro Team Uploaders

- Axel Beckert
- Vincent Hourdin
- Ben Keller
- Josue Ortega
- Vincent Prat
- Paul Sladen
- Roger Wesson
- Tomasz Buchert
- Filip Hroch
- Gijs Molenaar
- Thibaut Paumard
- Leo Singer
- Ole Streicher

debian
astronomy