

Science visions for the VO

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1. Motivation
2. What do users need (science)
3. What can the IVOA provide (technology)
4. Final recommendations

Motivation: to enable more science !

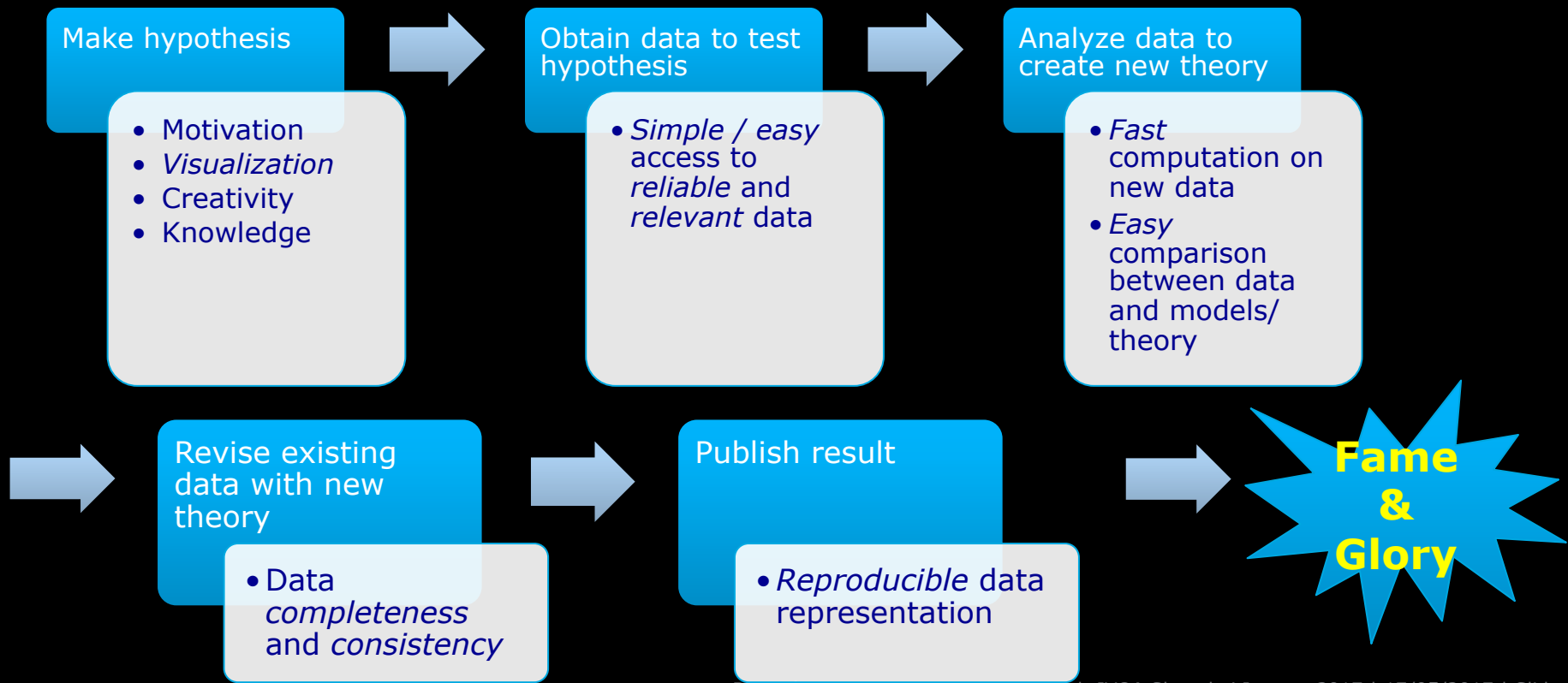


What we do here has the potential of improving human's
knowledge about the Universe

How do we do it? By understanding in the detail our users.



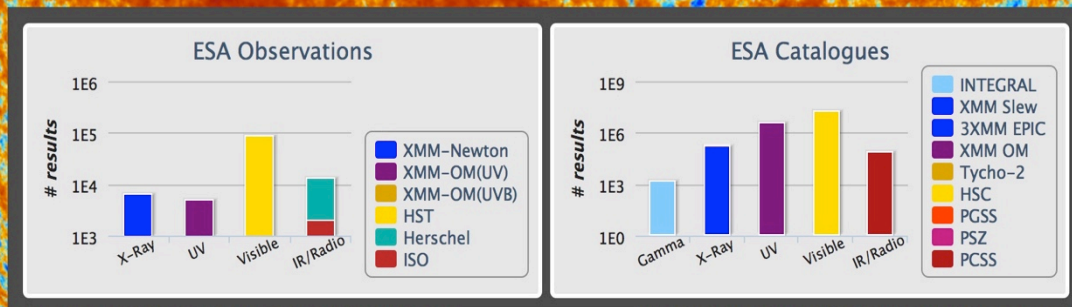
Timeline of a scientific paper





IVOA is enabling new types of science

Data Panel



Close data panel

Science is about revising the data



re-search



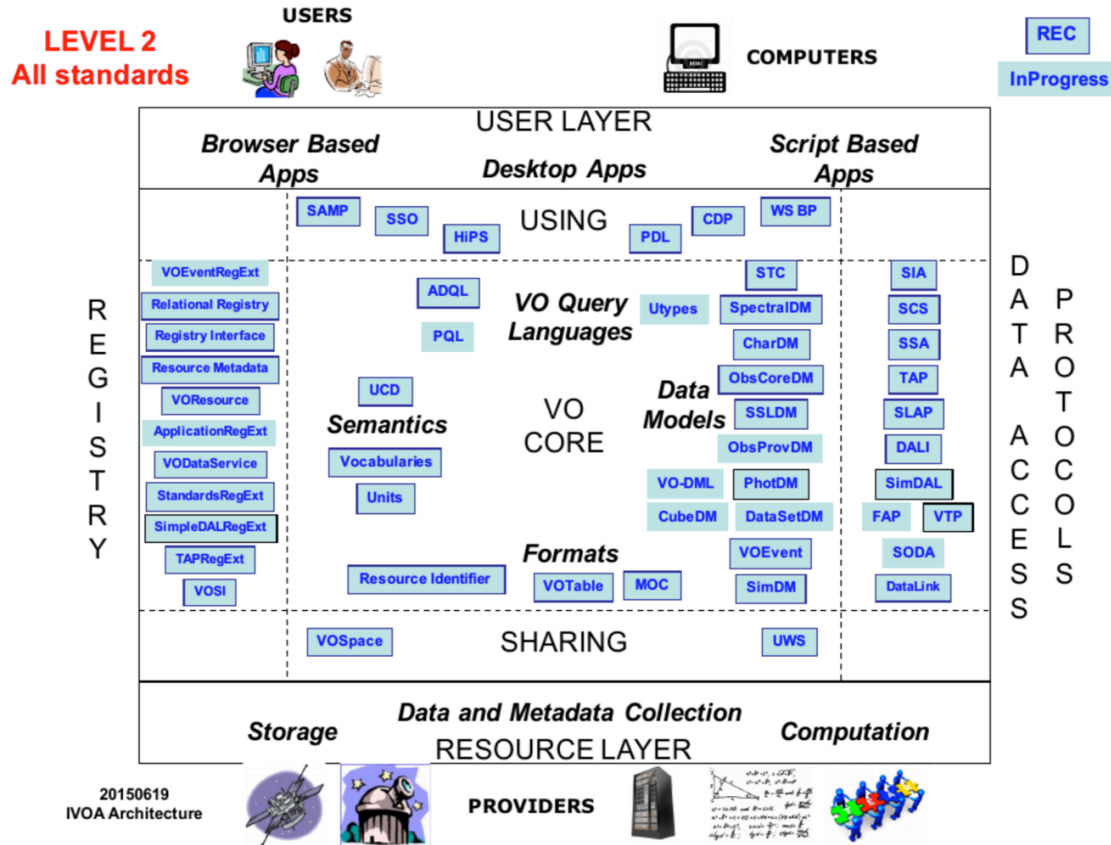
So what do scientists need?



1. *Visualization tools*
2. *Simple / easy access to reliable and relevant data*
3. *Fast computation on new data*
4. *Easy comparison tools between data and models/theory*
5. *Data completeness and consistency*
6. *Reproducible data representation*



What does the IVOA provide?



Technology

P. Dowler
TCG Report
IVOA Shanghai interop



What does the IVOA provide?



1. *Visualization tools* -> SAMP, HiPS
2. *Simple / easy access to data*
-> registry, ObsCore, SAMP, TAP, SODA, SIA/SSA
3. *reliable data*
-> DataModels, Semantics
4. *relevant data*
-> ??? (missing, links to papers?, data ratings?)



What does the IVOA provide?



5. *Fast computation on new data*

-> ??? Computing resources close to the data, VOSpace interface for distributed storage

6. *Easy comparison tools between data and models/theory*

-> SimDAL, but models usually created by users..

7. *Data completeness and consistency*

-> Registry complete and consistent?

8. *Reproducible data representation*

-> Scripting interfaces, ADQL, TOPCAT



Which other things any user wants?

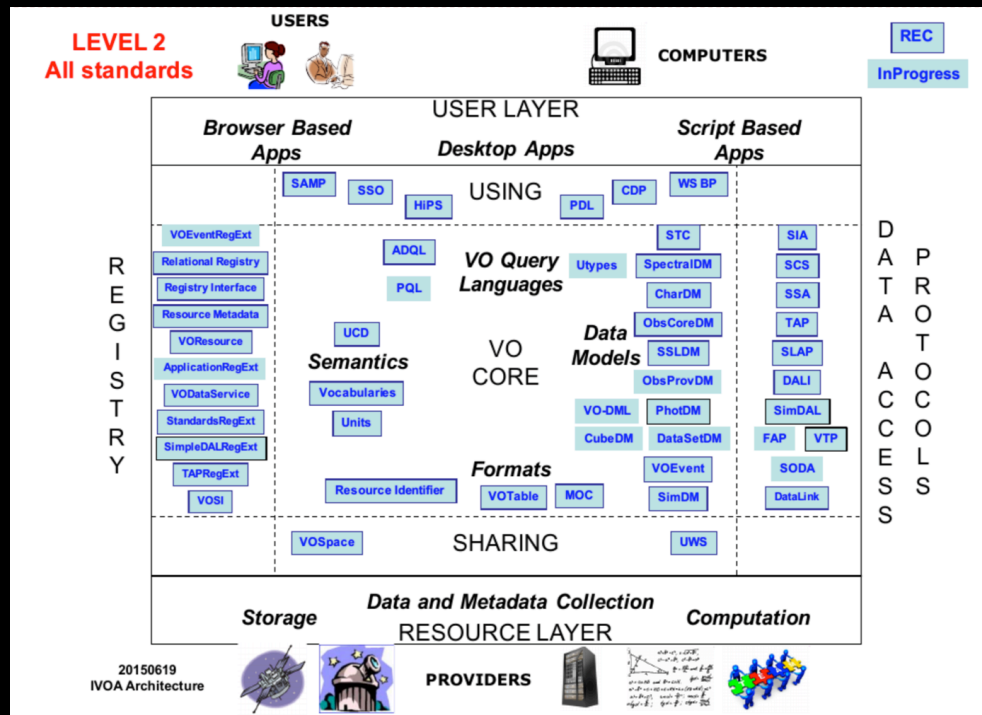


1. Easy to use
2. Robust
3. Works on mobile devices
4. Fast
5. Programmable
6. Customizable

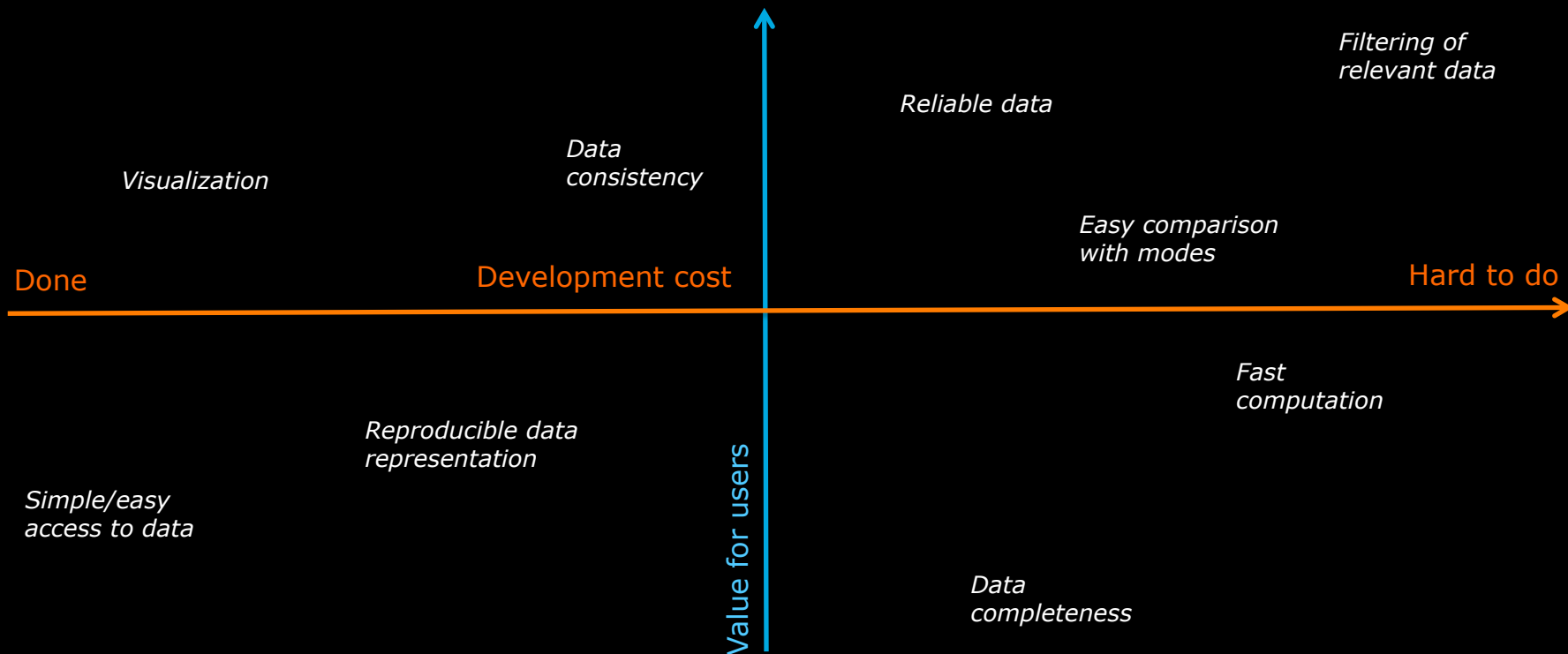


What's the mapping between science and technology?

1. Visualization
2. Simple / easy access to reliable and relevant data
3. Fast computation on new data
4. Easy comparison between data and models/theory
5. Data *completeness* and consistency
6. Reproducible data representation
7. Easy to use
8. Robust
9. Works on mobile devices
10. Fast
11. Programmable
12. Customizable



So what should we focus on?



The best way to make progress is via a constant **dialogue**:

science ↔ *technology*

- Always ask the question: how is the user going to use this?
- Always follow the user workflow to the paper and keep the big picture (is provenance clear? Can I explain/make a plot of this?)
- Connect to the future generation of users where they are: e.g. python, github, open source projects, social media, online open fora, connected to new big astronomy projects, using mobile devices and expecting quick answers



Astropy development history to March 2016 (points are files in the repository)

<https://youtu.be/TLuVM4j561E>

Astropy github repo has had 206 contributors, 18345 commits and 10 branches



Thanks!

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