E-accessible astronomy resources

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Do you need a pair of good eyes to do astronomy?

- Common assumption: astronomy is a visual science, you need to see the stars.

- In reality, the "visual" information comes to us as a stream of bytes.

  - For example, the telescope serves to aid vision.

Surfing with steady hands

- Electronic text materials provide a possibility but also a challenge to those with low vision. But there are also many requirements to these materials.

- Sight is not the only obstacle - an astronomer can have e.g. motor difficulties.

- Example: an elderly astronomer trying to click a check box with shaking hands.

What does accessibility look like?

- "Boring design for the blind" is a myth. It is a matter of whether the design is **functional** enough, not just pretty.

- With proper HTML code and other techniques we can make the text compliant with technological aids.

- If the coding is wrong, it may be impossible to open with such aids or it could be impossible to navigate the text.

The same page?

- Two versions of the same page. One is accessible, the other one is not. Can you tell which one is which?

Legislation and standards

- USA: Section 508 of the Rehabilitation Act concerning federal purchases:

- …" access to and use of information and data that is *comparable* to that provided to others."

- W3:n Web Content Accessibility Guidelines **(**WCAG) versio 2 (2008)

http://www.w3.org/TR/UNDERSTANDING-WCAG20/

WCAG v. 2 is meant as a practical tool

- The standard has levels of accessibility:
  - A minimum
  - AA medium
  - AAA as accessible as possible

- http://webaim.org/standards/wcag/checklist

- Example of an A level guideline: ”Form inputs have associated text labels or, if labels cannot be used, a descriptive title attribute.”

Example: Part of ADS search form code

As it is now:

<input name="obj_req" value="YES" type="checkbox">

Require object for selection

After adding text labels:

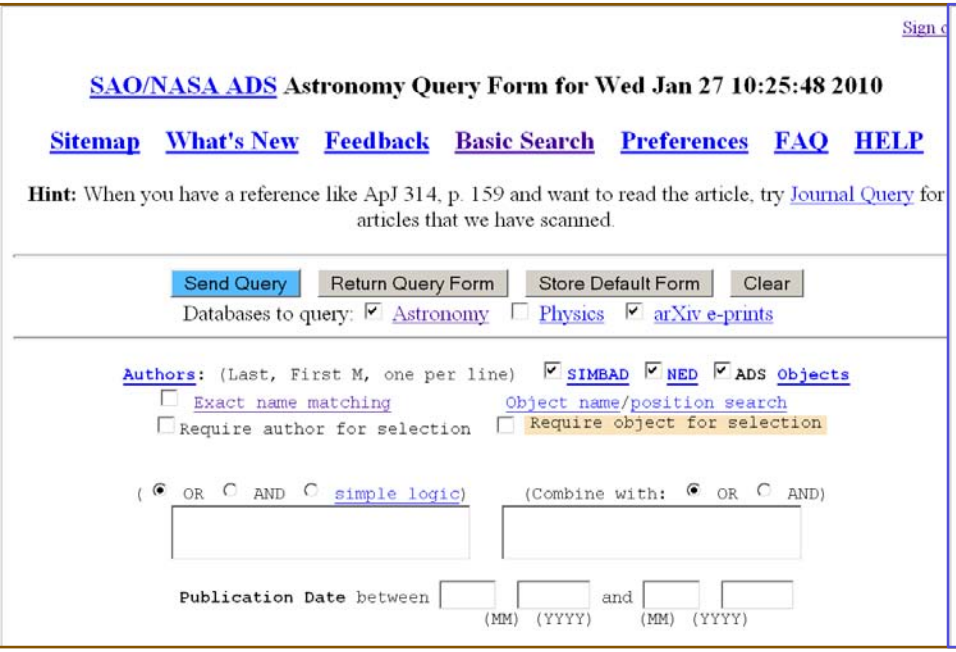
<input id="obj_req" name="obj_req" value="YES" type="checkbox">

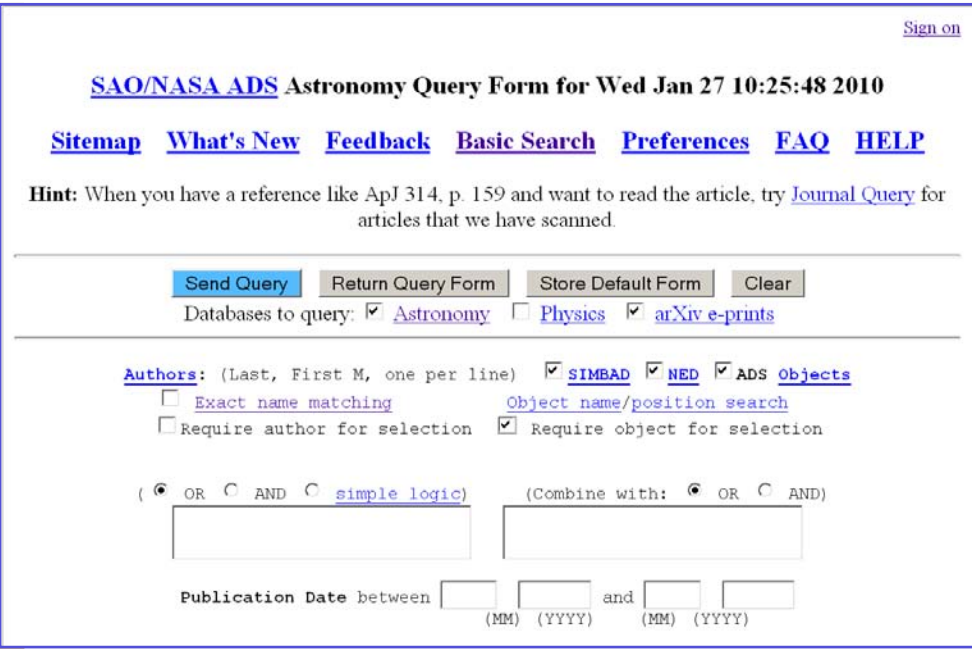
<label for="obj_req">Require object for selection</label>

See:
http://www.webaim.org/techniques/forms/controls.php

The code is helping a shaking hand

- It is not necessary to hit the checkbox, it is enough to click the text:

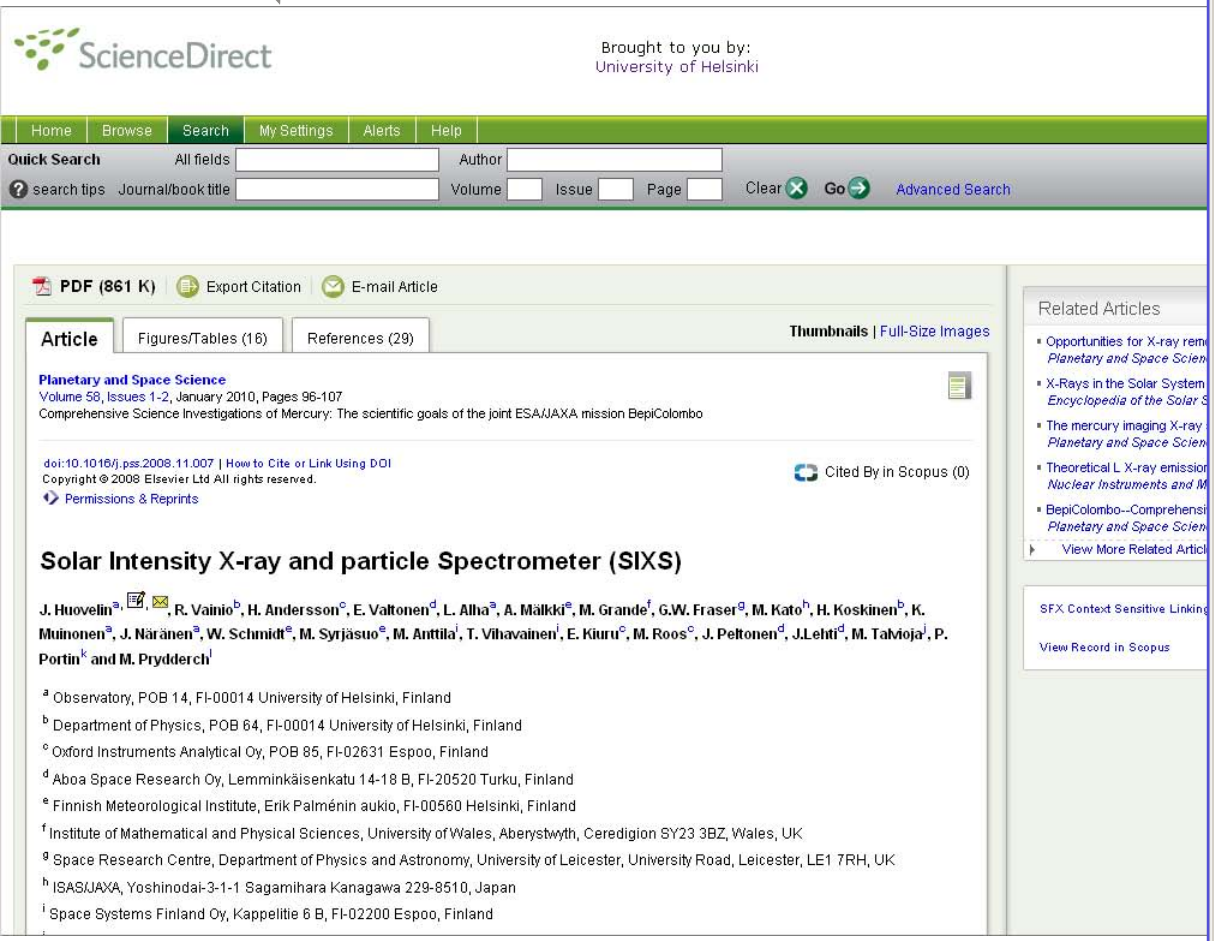




If it would only be a case of HTML code

- PDF, Flash, Office software…
- The material needs to have a **structure**. Otherwise, a blind person has to read from beginning to end, not being able to select a chapter or a footnote.
- PDF needs to be tagged PDF
- When writing text, it needs to be structured: a title must be defined as a title (not just bold text with bigger font) etc.

HTML with structure



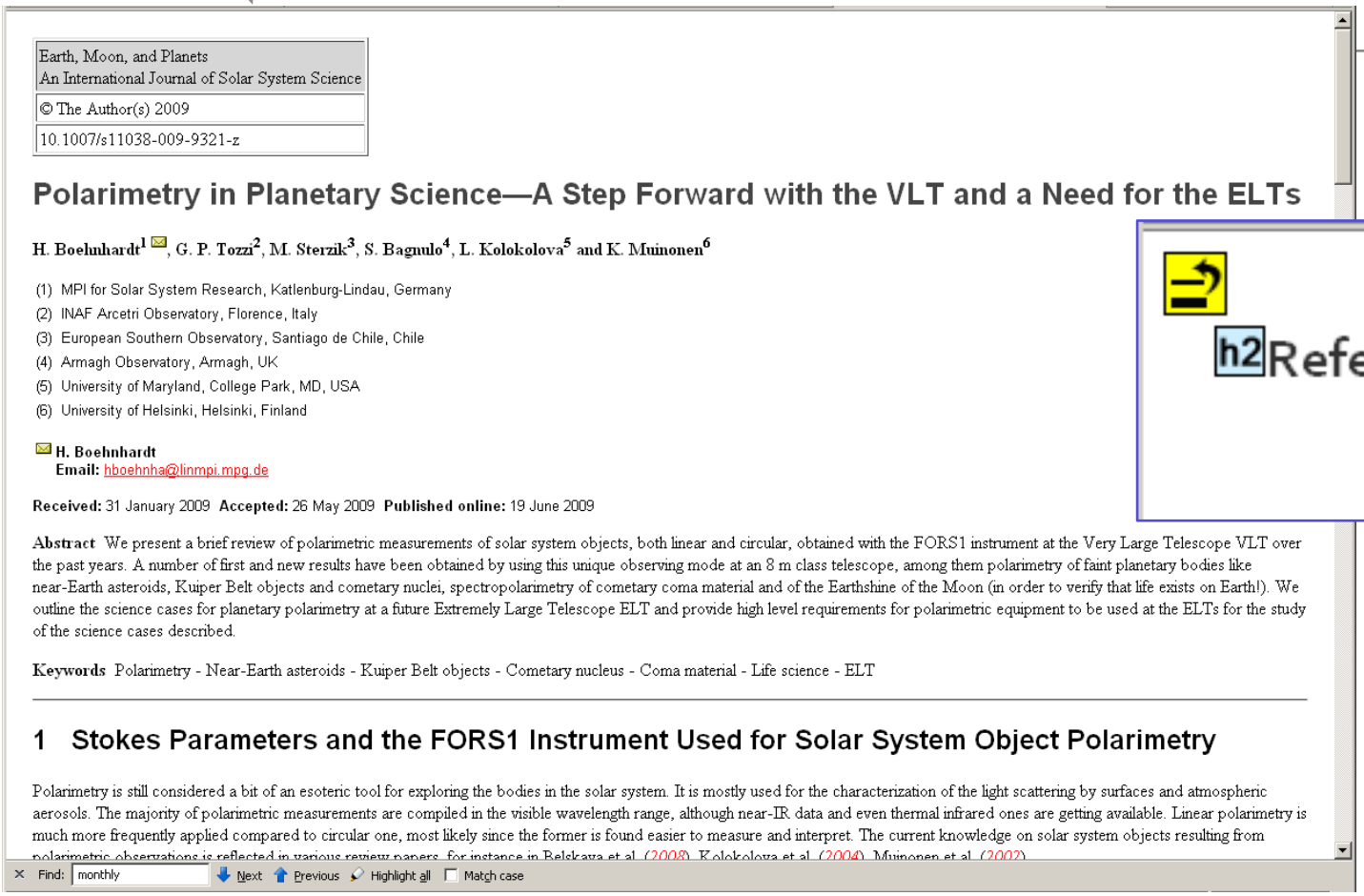
h4 Summary
h3 Abstract
h3 Article Outline
h3 1. Introduction
h3 2. Scientific objectives and requirements
- h4 2.1. General requirements
- h4 2.2. Measurement of X-rays
- h4 2.3. Measurements of energetic charged particles

h3 3. The instrument
- h4 3.1. SIXS sensor unit
  - h5 3.1.1. X-ray detector system
  - h5 3.1.2. Particle detector system

h3 4. Science performance of SIXS
- h4 4.1. X-ray detectors
- h4 4.2. Particle detector system

h3 5. The data from SIXS
h3 6. Plans for collaboration
h3 7. Conclusions
h3 Acknowledgements
h3 References

HTML without structure



Earth, Moon, and Planets
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Polarimetry in Planetary Science—A Step Forward with the VLT and a Need for the ELTs

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Abstract We present a brief review of polarimetric measurements of solar system objects, both linear and circular, obtained with the FORS1 instrument at the Very Large Telescope VLT over the past years. A number of first and new results have been obtained by using this unique observing mode at an 8 m class telescope, among them polarimetry of faint planetary bodies like near-Earth asteroids, Kuiper Belt objects and cometary nuclei, spectropolarimetry of cometary coma material and of the Earthshine of the Moon (in order to verify that life exists on Earth!). We outline the science cases for planetary polarimetry at a future Extremely Large Telescope ELT and provide high level requirements for polarimetric equipment to be used at the ELTs for the study of the science cases described.

Keywords Polarimetry - Near-Earth asteroids - Kuiper Belt objects - Cometary nucleus - Coma material - Life science - ELT

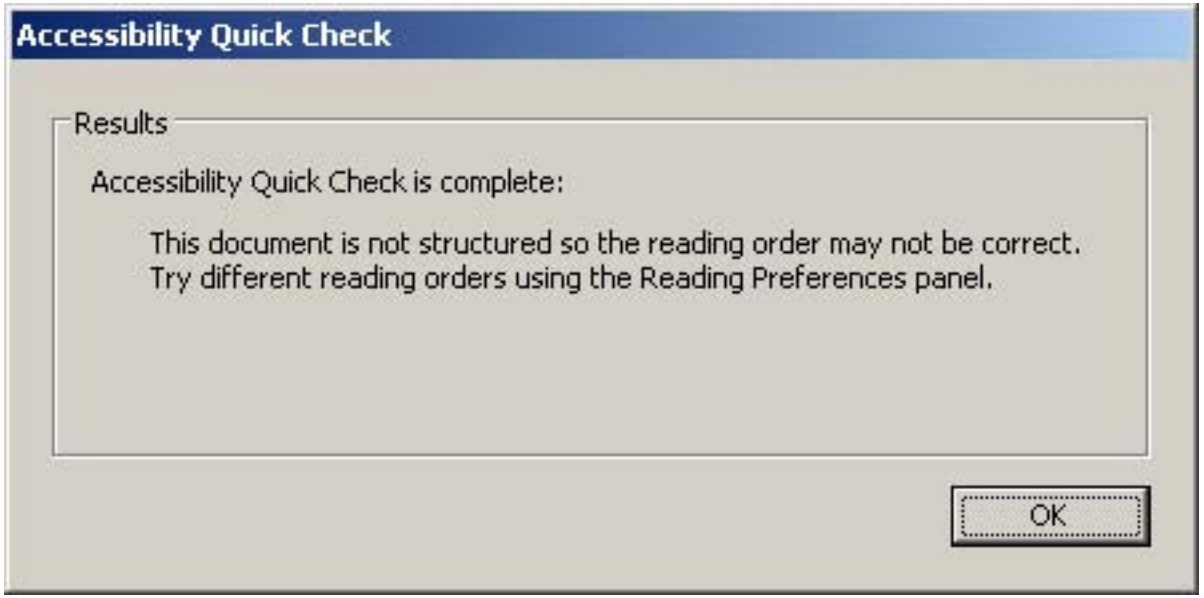
1 Stokes Parameters and the FORS1 Instrument Used for Solar System Object Polarimetry

Polarimetry is still considered a bit of an esoteric tool for exploring the bodies in the solar system. It is mostly used for the characterization of the light scattering by surfaces and atmospheric aerosols. The majority of polarimetric measurements are compiled in the visible wavelength range, although near-IR data and even thermal infrared ones are getting available. Linear polarimetry is much more frequently applied compared to circular one, most likely since the former is found easier to measure and interpret. The current knowledge on solar system objects resulting from polarimetric observations is reflected in various review papers, for instance in Belskaya et al. (2008), Kolokolova et al. (2004), Muinonen et al. (2002)

Find: monthly Next Previous Highlight all Match case

Seaching for structured PDF

- Many (or most) publishers produce online materials as PDF without structure:



Quick view on astronomy publishing

Title	Publisher	HTML fulltext	HTML structure	PDF structure	PDF bookmarks
Astronomy & Astrophysics	EDP Sciences	yes	ok	no	yes
Astrophysical Journal	IoP	yes	none	no	yes
Monthly Notices R.A.S.	Wiley	yes	none	no	no
Astron. Nachrichten	Wiley	no		no	no
Planetary Space Sci.	Elsevier	yes	ok	yes	yes
Earth, Moon & Planets	Springer	yes	none	no	yes

Things are surely looking forward?

- Elsevier was the winner of this brief check. Biggest publishers are making some effort.
- There are smaller publishers, institutes, libraries probably unaware of standards, and writing materials that are not accessible.
- **Beside standards, we also need easy to follow guidelines!**
- New technologies are constantly taken into use, new challenges (but also new possibilities)

Don't forget copyright

- It is not a given that a library hand e-materials over to a patron to be read with an aid
- Copyright laws vary surprisingly much
- Even when the right to access is written into a law, a signed agreement might take it away for a particular electronic material.

- **Please remember to check the accessibility options in agreements you sign!**

Opening your mind to the Universe

“I am freeing myself from the fixedness of the seen.

With my mind open to the universe, I hear the heavens' ebb and flow as music. It is the incomprehensibly wonderful revelation of music first heard after only ever having seen black spots and lines on a white page. As my ears open and my eyes close, I hear the planets dance.”

Tracy Farr: **The Blind Astronomer (**2002)

Thanks!

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