IperAstro: an *hypertext* of Astronomy

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ABSTRACT. The project IperAstro has the aim to realize an *hypertext* of astronomy, dedicated to the students of the advanced Secondary Schools. The *hypertext* is an electronic text arranged in sections which includes Java applets for better understanding of particular topics. Exercises and tests, with complete solutions and right or wrong answers, respectively, are included to provide a verification in any section in the CD. Written in HTML, IperAstro can be accessed using any last generation browser as a network or local (i.e. CD) applications.

1. Introduction

In the ministerial recommendations for the instruction to level of advanced Secondary School, Astronomy is indicated as an essential study for a correct and complete path of scientific education. Tasks as an example to the c.d. "programmi Brocca" for the teaching of Physics and Sciences of the Earth in the Secondary School. However such recommendations generally are disregarded.

The reasons must be searched both in the insufficient hour spaces destined to such matters and in the fact that the most teachers of Physics and Sciences, does not have acquired a sufficient preparation in Astronomy at the moment of their University formation.

On the other hand a demand of Astronomy, sped up from the mass media, is diffused. Hence the need to supply the world of the School with an instrument of formation (for the teacher) and of study (for the students) the most possible exhausting one.

2. The *hypertext*

The choice of the *hypertext* instrument is important in order to assure the agility of the understanding of the astronomical facts, from the moment that Astronomy itself is *hypertextual.* To reach this goal, in fact, we require the contribution of information concerning the objects to which the fact belongs, before still increasing our knowledge of any physical and mathematical background.

Leaving from this premise it has been realized an *hypertext* of Astronomy dedicated to the world of the advanced School. An *hypertext* with characteristics not of mere spreading (meritorious) of Astronomy towards the great public, which if we can easily find on the market, but with the purpose to supply with a didactic aid the aims of the study of Astronomy.

For sure backs, a systematic course must be the most possible related to the other scientific disciplines and in particular to Physics. In fact the *hypertext*, beyond to the wealth of images concurred from the use of the computer science instrument, tends not only to illustrate the same images, but above all to deal with the problematics of Astronomy, which the images refer, in to the right mathematical and astrophysical contest.

3. The content of the *hypertext*

The structure of the *hypertext* comprises eight thematic sections:
1-The naked eye sky;
2-The sky with the observation instruments;
3-The Solar System;
4-The Sun;
5-Stars;
6-Galaxies;
7-Cosmology;
8-The Extraterrestrial Life.

and following tool sections:

1-The physical background;
2-Overall exercises;
3-Tests;
4-Index;
5-Student paths;

Thematic sections are characterized with a content page, including all the links to available pages in the section, followed with a connection to the main content page. Return icons are also available from the starting, the previous and the next page.

All sections are equipped with guided exercises and multiple answer tests. Exercises come supplied with useful suggestions for the solution of the problem or also with the complete development of the exercise. The tests show at the end a verification of the supplied answers, in order to give way to the reader to estimate the acquired level of acquaintance.

The *hypertextual* links are made by words, phrases, images or icons evidenced by various colours from the normal text and underlined.

4. The *hypertext's* platform and structure

The language used is the **HTML**, the protocol of the Internet documents, with interactive parts realized with Java Applets. This makes directly that the *hypertext* can be read from CD through a browser or on Internet. The authors are thinking also a distribution by means of one publication through CD.

The possibility to find in the network the *hypertext*, places this product in the perspective of its uses in those schools, in always greater number, that have an access to

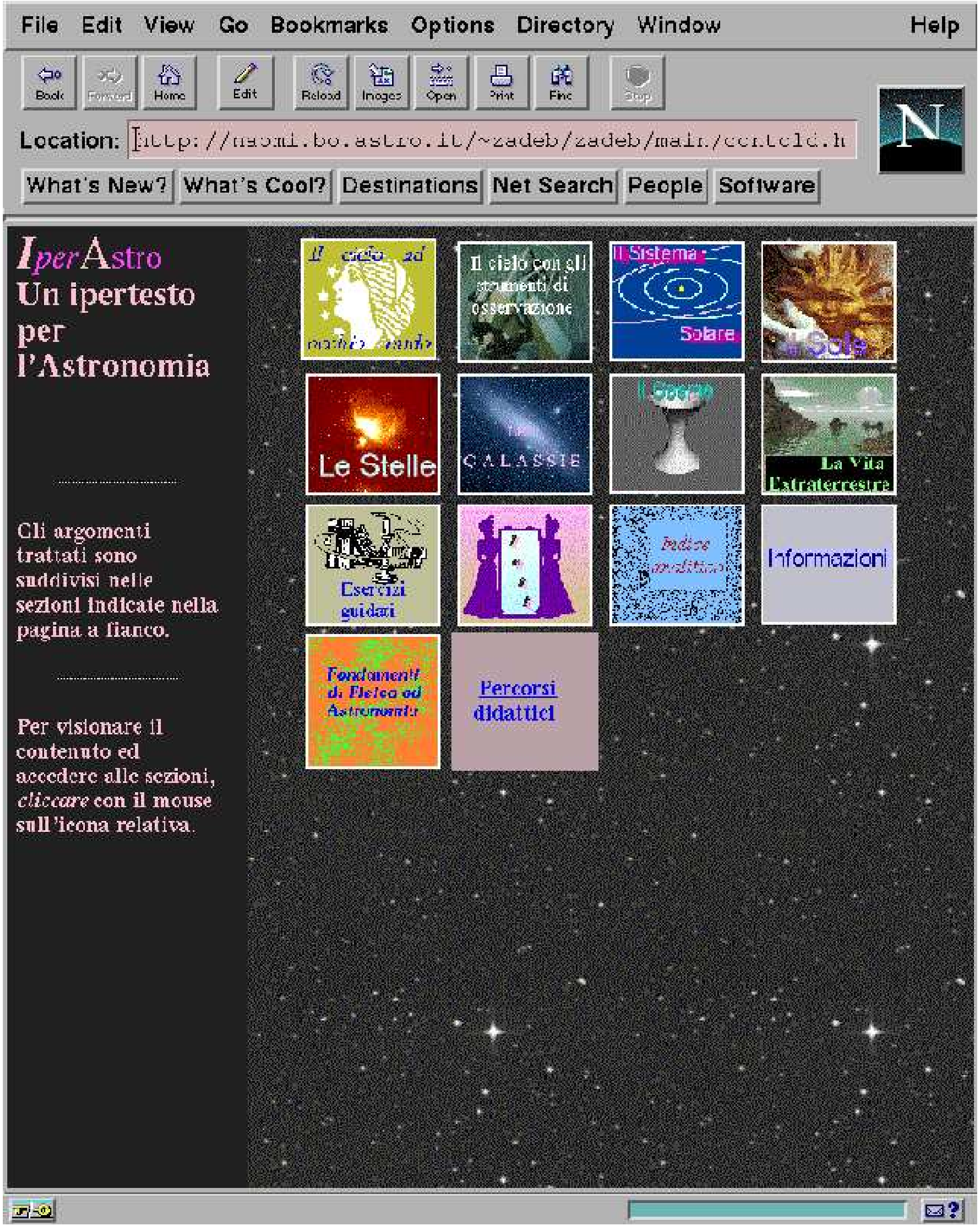

Fig. 1. IperAstro introduction to the sections.

the network. The *hypertext* can be also periodically updated following new available astronomical discoveries or new interpretative theories.

IperAstro is a platform independent product so it needs only a program for visualisation, a browser.

In a generalized manner IperAstro can be visualized by any browser of the last generation i.e. compatible with version 4 of **HTML**, the CSS2 (Cascading Style Sheet 2) and Java applications developed with the JDK 1.1 (Java Development Kit 1.1).

The IperAstro witnesses contain also textual documents purposely predisposed for being shown and being subsequently printed in toto or part. The chosen format for textual documents is the Adobe Portable Document Format (pdf). To see pdf documents it is necessary therefore to install the public domain program Acrobat Reader which can be freely distributed with that CD or downloaded on the network.

IperAstro can be used on various operating systems (Windows, Macintosh, Unix and OS/2). The system must be equipped with a last generation browser (Netscape, Internet Explorer or others) and the Adobe Acrobat Reader.

Example of advised configuration for Personal Computers :

1. Processor Pentium or later
2. Operating systems Windows or others
3. CD reader 8x or better
4. Graphical Resolution 1024 x 768 (suggested)
5. Browser (Internet Explorer 4 or later, Netscape 4.1 or later).
6. Acrobat Reader

Unix system

1. Any endowed Unix system
2. Browser of the last generation
3. Acrobat Reader

The mail address *bedogni@bo.astro.it*. A demo is shown at the following web address: *http://naomi.bo.astro.it/ bedogni/demo.htm.*