

The New York Times

The Cosmos, Surveyed

PHILADELPHIA — The shabby-looking tube of wood and varnished paper diagonally mounted in a case is meant to be the climactic object of “Galileo, the Medici and the Age of Astronomy,” an important exhibition that

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EXHIBITION REVIEW

opens at the Franklin Institute on Saturday. And it is certainly astonishing, though not in the way you might imagine. Its importance is the inverse of its appearance. The tube looks as if it was constructed out of the inner part of a huge roll of paper towels, but it is one of two surviving telescopes Galileo used in Florence in the 17th century, when he reshaped the cosmos with meticulous observations and startling interpretations. Those astronomical investigations are now being honored with international celebrations on their 400th anniversary.

But by the time we reach that telescope and the imaginative gallery it introduces, we have seen things even more remarkable: ornately decorated quadrants of enameled brass, metal calipers, arcane charts, minutely inscribed maps, spheres within spheres like



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Galileo, the Medici and the Age of Astronomy An armillary sphere in this show at the Franklin Institute in Philadelphia.

compass roses from other worlds, codexes and manuscripts, cylinders, dials, rings, rods and boxes.

Some of these are extraordinarily beautiful: finely wrought, elegantly constructed, sensuously formed. Like the telescope, some also have the aura of having once been handled for profound purposes: a set of brass compasses in a battered black case are said to have been used by Michelangelo.

They are all instruments

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of exploration and investigation, models of planetary and stellar motion, surveying instruments and mapmaking equipment. Nearly all were made during two centuries of the Italian Renaissance. And as presented here they are the accomplishments of a culture created by the patronage of the Medici dynasty in Florence, rulers whose portraits are on display.

These objects come from the Medici's collection, once housed in the Uffizi Gallery not far from the artworks they were meant to complement. Now they are part of the Institute and Museum of the History of Science in Florence, which is undergoing renovation and is to reopen in the fall. Three of its curators were involved, Filippo Camerota, Mara Miniati and Giorgio Strano. (The objects can be seen in their pre-renovated, somewhat quaint Italian setting, at brunelleschi.imss.fi.it/museum/index.html.)

As mounted at the Franklin, some aspects of this show are less than ideal, particularly because the final two galleries are adjacent to a “Sports Challenge” exhibition, which uses athletics to illustrate physical principles. Galileo wouldn't have minded: he was known to drop and roll balls in experimentation, if not the path of golf swings. But the canned cheers and the thuds of sports apparatus can overwhelm the Galileo exhibition's more celestial concerns.

The Galileo show, though, should not

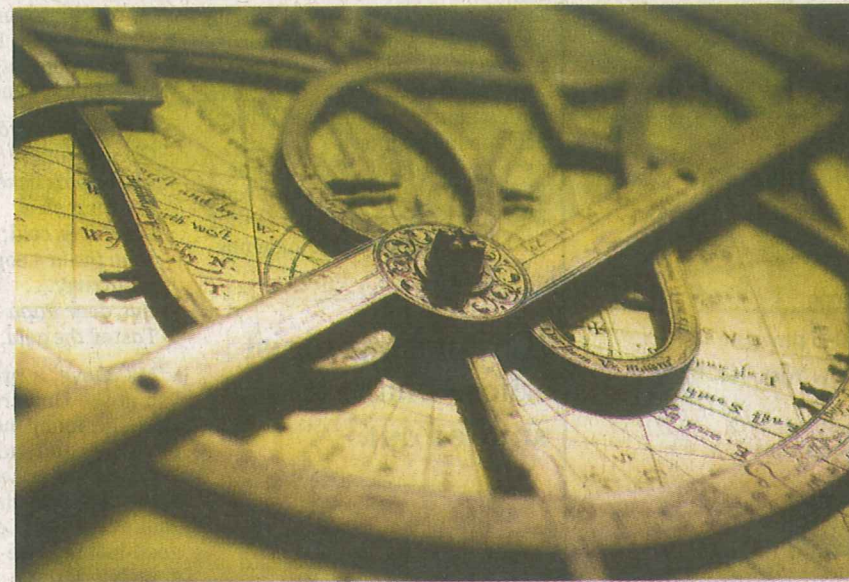
“Galileo, the Medici and the Age of Astronomy” opens Saturday and runs through Sept. 7 at the Franklin Institute, 222 North 20th Street, Philadelphia; (215) 448-1200, sln.fi.edu.

be missed. These tools, which gave shape to and made sense of the surrounding world, now, in much the same way, illuminate our understanding of the Western culture then being born: we begin to comprehend how it was circumscribed, shaped and measured.

The presiding genius is not Galileo but Cosimo I (1519-1574), the first to transform the commercial Medicis into rulers. It was Cosimo, we learn, who constructed the Medici cosmos, who took the themes of the Italian Renaissance and wove them together, supplementing the systems of the great ancients — Euclid, Archimedes and Ptolemy — with other ideas: that knowledge was an aspect of power, that power was required for proper order and that social order itself can lead to an increase in knowledge. Social order, in fact, was seen as a reflection of geometric order. Geometry and surveying were necessary to master the physical world; knowledge of mechanics was necessary to create military fortifications and weaponry. There are gun sights here that look like surveying instruments, and surveying instruments that were worn like swords.

While creating a new state, Cosimo celebrated the era's developing cosmos by commissioning Giorgio Vasari to oversee the redesign of a palazzo, also creating the Map Room, a tribute to human knowledge, reproducing on its walls the maps of Ptolemy's second-century “Cosmography.” A computer animation here shows the elements of his plan, some left unfinished. From openings in the ceiling's map of the heavens, two immense globes — celestial and terrestrial — were to have been lowered into the room.

Here too is a reproduction of a ceiling mural from the Room of Military Architecture — also known as the Mathematics Room — that portrays a mythic his-



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A ninth-century brass astrolabe from the Medicis' collection. An astrolabe is an astronomical calculator used to tell the sun's rising and setting times.

tory of mathematical enterprise in which some of the very instruments displayed in the gallery are shown.

The Franklin could have gone further in supplementing the bilingual texts provided by the Italian curators. You will want to know more than these panels can possibly tell you, particularly about larger issues. The exhibition opens with models of the astronomical instruments mounted on the outer facade of the Santa Maria Novella church, for example, but you can't really grasp their full import without returning to them at the end. Medicean accomplishment was not just a matter of power and knowledge; it incorporated devotion. A model here of the Santa Maria del Fiore shows how, through a circular window in its front, the sun's rays would shine,

charting a path along a sundial in the church's floor. Beauty, power, knowledge and religion intertwined.

After passing through these galleries, Galileo's unimposing telescope takes on a new resonance. These Medicean objects created the context for Galileo's work; he was literally in the service of the Medicis. His explorations now seem an extension of theirs, or better, an expansion.

It can still be a bit jarring to pass into the final gallery behind the telescope. It is designed to be a stand-alone exhibition about the instrument and will travel to Stockholm after closing here in September. The displays are filled with replicas and facsimiles rather than the precious originals found in the Medici galleries; these reproductions travel

more easily and with less risk.

But the replicas here are not really a problem. In this gallery the history of the telescope is traced, Galileo's innovations are explained, his discoveries outlined and 17th-century optics surveyed. Varied telescope models are pointed at projected images that give some inkling of how little Galileo could actually see, and how much his mind was required as well as his eyes.

Here the concepts rather than the objects matter. The geometric principles and the love of instrumentation seen in the Medici galleries here are transmuted into something abstract, almost ethereal. It is not the material object that becomes the instrument of power or a thing of beauty, but what the mind constructs out of sensory experience. There are demonstrations of laser lights passing through lenses, showing how difficult it was to construct a series of lenses that would magnify an image without distorting it, that would alter the scale but not the shape. It's a geometrical exercise in lines and mapping that deals with something not even palpable: light.

If you look at the kinds of minuscule images Galileo studied, and see the patient drawings he made of Saturn's rings or the Moon's mountains, you understand just how extraordinary a mind it took to construct such a cosmic order out of such limited material. You could probably buy a better telescope at Toys 'R Us today, but what is seen is less important than how it is seen. Galileo, by turning the Medici enterprise into an abstract quest, helped lay the foundations of modern science.

No wonder this made the church nervous: it is as if the power of the mind were rivaling the powers of the creator. Seen here, together with the Medicis' collection, the effect is exhilarating, a tale of literal enlightenment.