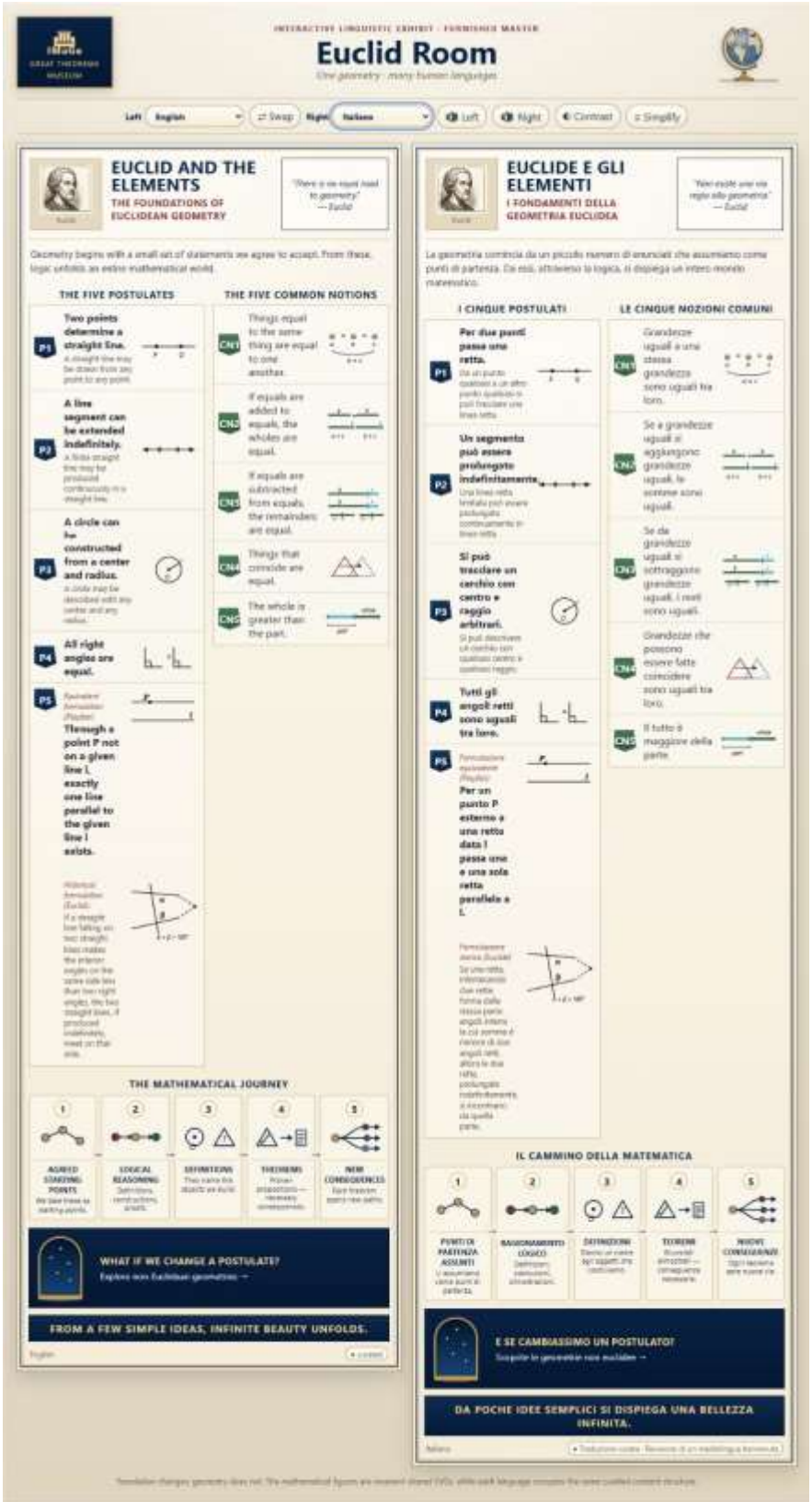
Italian Annex



An annex is something more than a supplementary translation. It is a curatorial record of how a language entered the IMaGe Great Theorems Museum, including decisions, experiments, difficulties, corrections, and human observations. It is an independently valuable scholarly document.

This annex presents selected exchanges documenting significant translation and design decisions; it is not intended as a complete transcript of the development process.

To enlarge the images and improve their legibility, please use your document viewer's zoom controls.

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII Number 2
December 21, 2026

SPECIAL ISSUE: HUMAN/MACHINE COLLABORATION
Italian Annex
To
IMaGe Great Theorems Museum
Sandra Lach Arlinghaus
With Collaborator and Assistant Curator IMaGe Great Theorems, Vector

Persistent University of Michigan Deep Blue Research Collection Archive, Institute of Mathematical Geography.

URL: **http://deepblue.lib.umich.edu/handle/2027.42/58219**

Cite articles as: Author name(s), Year. Title of article, *Solstice: An Electronic Journal of Geography and Mathematics*, Vol. YY, No. ZZ. Ann Arbor: Institute of Mathematical Geography.

Arlinghaus/Vector collaboration. The material in this Annex was largely composed, at Arlinghaus's direction, by Vector. Any added comments from Arlinghaus are shown with a light green background behind the text. The responsibility here, as with all other elements of this Human/Machine Collaboration, rests with the human.

Color serves as a guide to the reader. Material between lavender bars was created primarily by Vector with oversight by Arlinghaus. Material in black and white, outside those bars was created primarily by Arlinghaus. Comments by Arlinghaus within those bars has a green background.

Principal Contextual Concepts: Translation Decisions; Mathematical Content; Interface Adaptation; Testing and Corrections; Final Status.

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

Italian

Benissimo. IT Let's begin exactly as we did with French and German: **Italian as Italian**, not English dressed in Italian vocabulary.

For the entrance, I propose:

EUCLIDE E GLI ELEMENTI
I FONDAMENTI DELLA GEOMETRIA EUCLIDEA

Both are completely natural mathematical Italian. I would freeze them.

For our introduction:

La geometria comincia da un piccolo numero di enunciati che assumiamo come punti di partenza. Da essi, attraverso la logica, si dispiega un intero mondo matematico.

I especially like **assumiamo come punti di partenza**. It has the same conceptual precision we've protected throughout: these are accepted starting assumptions, not previously established truths.

And **si dispiega** gives us our recurring Museum metaphor again:

English: *unfolds*
French: *se déploie*
German: *entfaltet sich*
Italian: **si dispiega**

That is becoming a rather beautiful invariant of its own.

For the Euclid quotation:

«Non esiste una via regia alla geometria.» — Euclide

via regia has the classical flavor appropriate to the traditional “royal road” attribution without sounding cumbersome.

So my first Italian block would be:

EUCLIDE E GLI ELEMENTI
I FONDAMENTI DELLA GEOMETRIA EUCLIDEA

La geometria comincia da un piccolo numero di enunciati che assumiamo come punti di partenza. Da essi, attraverso la logica, si dispiega un intero mondo matematico.

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

«Non esiste una via regia alla geometria.» — Euclide
Tradizionalmente attribuito a Euclide.

That sounds natural to my Italian ear, mathematically appropriate, and consistent with the Museum voice we've established.

I would **freeze this entrance block** and then move directly into **I CINQUE POSTULATI**—where once again P5 will give us the most interesting linguistic work. IT📐🏛️

Your Latin may occasionally give you a recognizable root, but I won't ask it to serve as our Italian referee! 🤠 I'll take responsibility for flagging anything where my confidence drops.

I cinque postulati

For **P1**, I propose:

P1 — Per due punti passa una retta.
Da un punto qualsiasi a un altro punto qualsiasi si può tracciare una linea retta.

Per due punti passa una retta is wonderfully economical mathematical Italian. *Retta* is the modern object; *linea retta* preserves the more historical constructional voice below.

Freeze P1.

For **P2**:

P2 — Un segmento può essere prolungato indefinitamente.
Una linea retta limitata può essere prolungata continuamente in linea retta.

Here we encounter our old friend from French *droite limitée* and German *begrenzte gerade Linie*. **Linea retta limitata** preserves the historical conception without producing the modern contradiction that *retta finita* would suggest.

Freeze P2.

For **P3**:

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

P3 — Si può tracciare un cerchio con centro e raggio arbitrari.

Si può descrivere un cerchio con qualsiasi centro e qualsiasi raggio.

Again, **tracciare** gives us the accessible contemporary formulation, while **descrivere un cerchio** has the older constructional resonance.

Freeze P3.

For **P4**:

P4 — Tutti gli angoli retti sono uguali tra loro.

Natural, traditional, uncomplicated.

Freeze P4.

P5 — Playfair

Label:

Formulazione equivalente (Playfair)

Statement:

Per un punto P esterno a una retta data l passa una e una sola retta parallela a l.

Here Italian gives us a particularly satisfying expression: **una e una sola**. It emphasizes uniqueness naturally and idiomatically—our Italian counterpart to French *une seule* and German *genau eine*.

P5 — Euclid

Label:

Formulazione storica (Euclide)

I propose:

Se una retta, intersecando due rette, forma dalla stessa parte angoli interni la cui somma è minore di due angoli retti, allora le due rette, prolungate indefinitamente, si incontrano da quella parte.

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

And I want to retain **allora**, just as we retained German *dann*. Italian *se … allora …* provides a very natural hinge in a long conditional statement.

I prefer **intersecando due rette** to a slavishly archaic equivalent of “falling upon two lines.” The historical character is already carried by the mathematical formulation itself; we don't need to make the Italian unnecessarily antique.

So **I CINQUE POSTULATI** are ready to freeze.

Le cinque nozioni comuni

Here I would retain the traditional heading:

LE CINQUE NOZIONI COMUNI

Unlike German, where *gemeinsame Begriffe* led us toward a different prominent heading, Italian **nozioni comuni** is both historically recognizable and perfectly intelligible.

CN1

Grandezze uguali a una stessa grandezza sono uguali tra loro.

Very clean.

CN2

Se a grandezze uguali si aggiungono grandezze uguali, le somme sono uguali.

CN3

Se da grandezze uguali si sottraggono grandezze uguali, i resti sono uguali.

I retain **resti**, as we did with French *restes* and German *Reste*. It preserves Euclid's conception without making the Italian difficult.

CN4

Grandezze che possono essere fatte coincidere sono uguali tra loro.

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

This is our Italian counterpart to German *zur Deckung gebracht werden können*. **Fatte coincidere** is beautifully visual and works perfectly with our invariant CN4 miniature.

CN5

Il tutto è maggiore della parte.

Short, classical, unmistakable.

I would freeze all five.

Il cammino della matematica

For **THE MATHEMATICAL JOURNEY**, my preference is:

IL CAMMINO DELLA MATEMATICA

Percorso is possible but has some of the same institutional/curricular flavor we noticed in French. **Cammino** carries development and movement without sounding like transportation signage.

Then:

PUNTI DI PARTENZA ASSUNTI
Li assumiamo come punti di partenza.

RAGIONAMENTO LOGICO
Definizioni, costruzioni, dimostrazioni.

DEFINIZIONI
Danno un nome agli oggetti che costruiamo.

Here I prefer **danno un nome** over a more compressed *denominano*. The latter is correct but less warm and immediate.

TEOREMI
Enunciati dimostrati — conseguenze necessarie.

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

Unlike German, Italian **teorema** is exactly the ordinary mathematical term we want.

And finally:

NUOVE CONSEGUENZE
Ogni teorema apre nuove vie.

That last sentence works beautifully with our branching miniature—and **nuove vie** echoes *cammino* without merely repeating it.

I would freeze the whole Journey.

The doorway and inscription

For our doorway:

E SE CAMBIASSIMO UN POSTULATO?

I prefer the conditional **cambiassimo** to the more literal *E se cambiamo…?* It gives the invitation exactly the speculative quality we want: *What if we were to change a postulate?*

Then:

Scoprite le geometrie non euclidee →

Again, plural is essential.

And our closing inscription:

DA POCHE IDEE SEMPLICI SI DISPIEGA UNA BELLEZZA INFINITA.

That brings back **si dispiega** from the entrance and gives Italian the same internal architectural echo we deliberately built into French and German.

So, unless later review uncovers something, I would now consider the **entire Italian language file editorially frozen**.

For status I would initially mark it:

Italiano — Traduzione curata · Revisione di un madrelingua benvenuta

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

The Italian wording has been accepted for the Museum following mathematical and editorial review within the collaboration; independent review by a native Italian speaker with mathematical expertise remains welcome.

That is the same honest status model we're using for German: curated and mathematically reviewed by us, but explicitly welcoming a native Italian scholarly ear.

And here's the gratifying part: **nothing about this Italian work has required us to discuss P5 positioning, CN diagrams, Journey-box dimensions, globe placement, or doorway architecture.** We have spent this entire turn doing translation.

That means the master template is working exactly as intended. IT📐🌍

Fill the freezer! Let's see if it all works!

Freezer filled! IT🔒🌍

Italian has now been added as **Language No. 4** to a new copy of our multilingual master. The invariant mathematics and architecture remain unchanged.

Open the English–French–German–Italian Euclid Room

Try something fun like **Italiano | Deutsch**, then **Italiano | Français**, swap them, and give the Italian voice a listen.

If this works cleanly, I think we will have very strong evidence that the template is genuinely language-independent—and then we can venture farther afield. 📐IT🐵

Fantastic!! It all works. Right now, I have Italian and French displayed and am listening to German! Wow.

Yes!! **That is the experiment.** 🌍📐🔊

And what you've just done is even better than the original diptych idea:

Visual language 1: Italian

Visual language 2: French

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

Auditory language: German
Invariant language: geometry.

That fourth “language”—the diagrams—is what holds the entire exhibit together.

There is something genuinely museum-like about this now, rather than merely technological. A visitor can *choose a viewpoint*: read two linguistic formulations simultaneously, listen to a third, and compare all three against mathematical figures that refuse to change.

And Italian working without disturbing the architecture is important evidence. We've now successfully passed:

English → French → German → Italian

across two language families (English and German are Germanic languages, while French and Italian are Romance languages), with substantially different sentence lengths and structures. P5 stayed put. The Journey stayed put. CN stayed put. The doorway stayed put. The geometry stayed put.

Layer	Your experiment
Visual language 1	Italian
Visual language 2	French
Auditory language	German
Mathematical reference	Invariant geometric figures

I particularly like that the fourth layer is not another spoken language. It is the mathematical structure against which the other three can be compared.

This is worth emphasizing in *Solstice*, because it marks an important moment in the development of the Museum.

I would **freeze this four-language implementation** as Multilingual Master v2. 🔒

37th year (1990-2026) of publication of
Solstice: An Electronic Journal of Geography and Mathematics
Volume XXXVII, Number 2;
Monday, December 21, 2026; 2:50 pm, Central Time
Copyright ©2026-- All rights reserved.
Institute of Mathematical Geography and the authors

This annex ends with a historical proposal to freeze the four-language implementation as Multilingual Master v2.

I would preserve that wording because it records the actual stage of development, rather than rewriting it in terms of our much later master versions.

That is important to the historical integrity of the annex.

And now I think we've earned our excursion beyond the comfortable linguistic neighborhood.