

# Western Philosophy from Athens

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From the problems of nature to the knowledge of being

**Socrates (Σωκράτης)**

Athenas, 390 b.C.

Ágora, the Assembly of the Polis

# **Western Philosophy from Athens**

**From the problems of nature to the knowledge of being**

MarpX Theme Socrates

# Outline

- 0. Title
- 1. Transition Slide
- 2. Normal Slide
- 3. Headers
- 4. Images
- 5. Ordered and Unordered Lists
- 6. Tables
- 7. Mathematics in LaTeX
- 8. Code
- 9. Quotes
- 10. References

# Transition Slide

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**Additional Text about what's ahead**

# Is Algebraic Graph Knowledge a Possibility ?

**Research** has been conducted in order to evaluate the possibility of reaching meaningful knowledge from Algebraic Graph transformations.

- Model Cheking and theorem proving are viable paths.

When the neet to make strong assertions becomes inevitable:

- This is the first way: outstanding assertion!

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\* Note: This is a very long footnote line intended to test the layout of two.

# H1 - H1 level of header

## H2 - H2 level of header

### H3 - H3 level of header

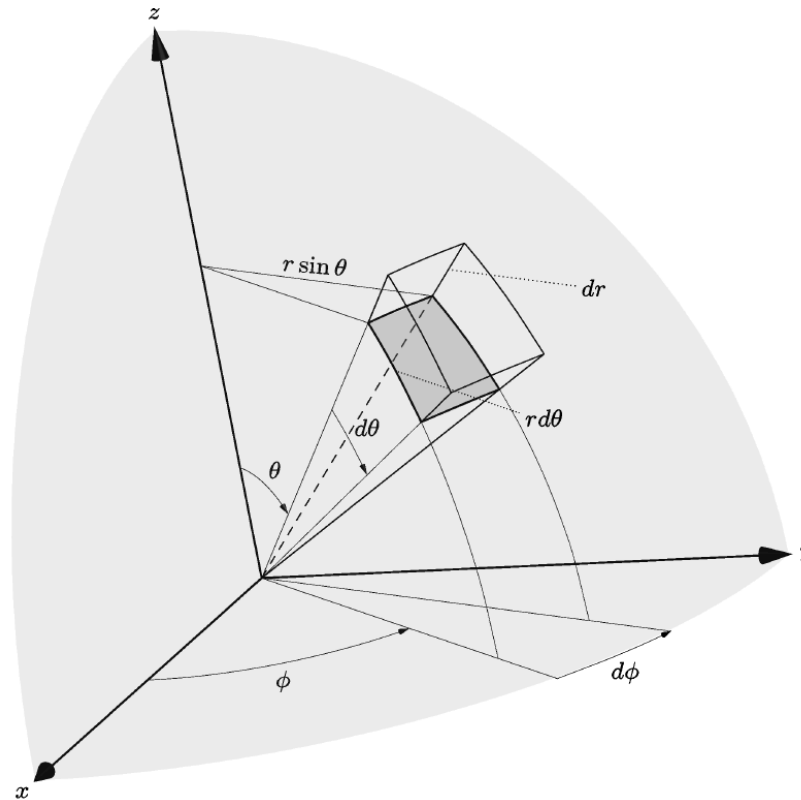
#### H4 - H4 level of header

##### H5 - H5 level of header

###### H6 - H6 level of header

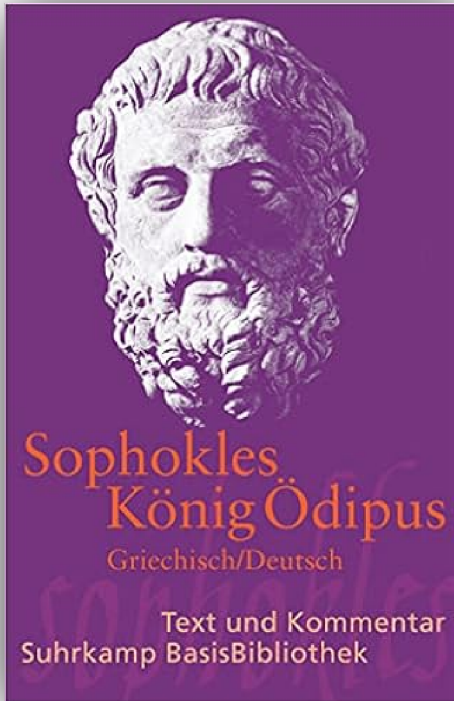
- This is a fragment o normal text written here in order to exemplify the use of several featrues in CSS.
- This is a fragment o normal text written here in order to exemplify the use of several featrues in CSS.
  - This is one **bold** comment.
  - This is another *italic* comment.

# One image slide

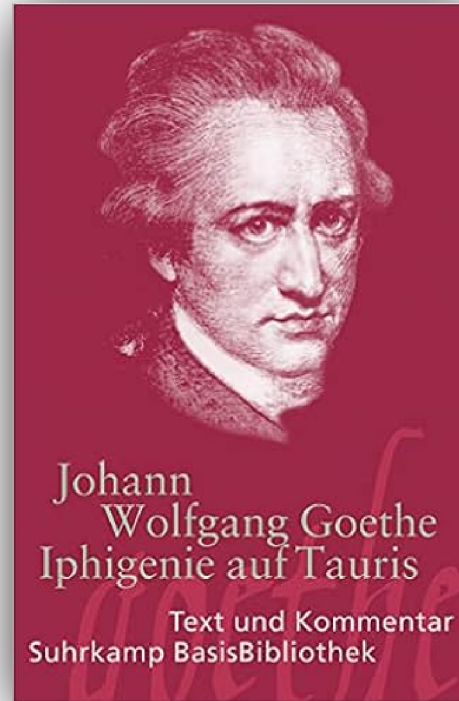


**Fig. 7.1:** Object defined in terms of spherical coordinates.

# Images fit into columns



**Fig. 8.1:** Sophokles, Suhrkamp (2015).



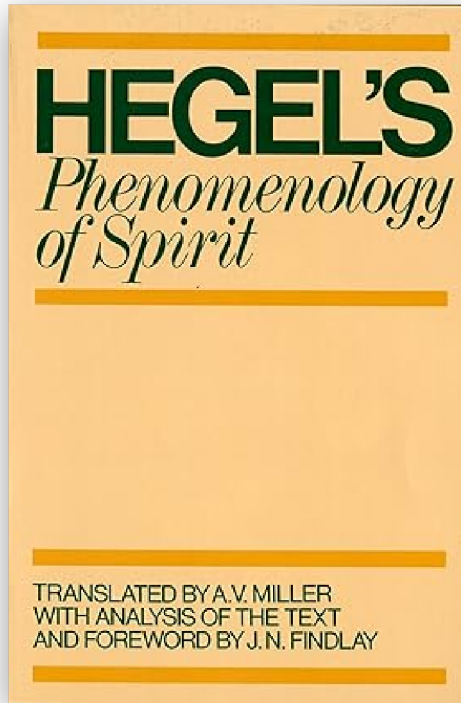
**Fig. 8.2:** Göthe, Suhrkamp (2011).



**Fig. 8.3:** Heine, Suhrkamp (2011).



# Image and text on the same slide (1)



**Fig. 9.1:** *Phänomenologie des Geistes* Oxford edition.

## Hegels Phänomenologie

Das Buch trug ursprünglich den Titel "Phänomenologie des Geistes" von seinem Autor: G.W.F. Hegel.

- Das **1807** veröffentlichte Werk markiert eine bedeutende Entwicklung des deutschen Idealismus nach Kant.
- In diesem Buch entwickelt Hegel seine Konzepte der Dialektik.

Price at Amazon used to be \$ 17.83.

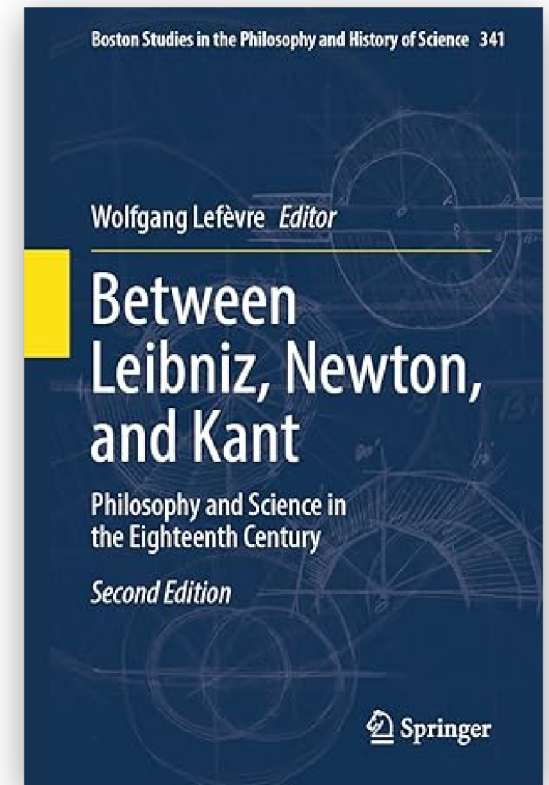
# Image and text on the same slide (2)

## Kant, Leibniz & Newton

Philosophy and the sciences were closely linked in the age of Leibniz, Newton, and Kant.

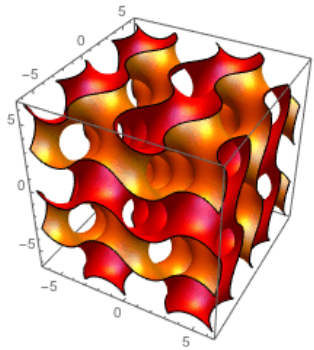
This addresses the transformations of metaphysics as a discipline, the emergence of analytical mechanics, the diverging avenues of 18th-century Newtonianism, the body-mind problem, and philosophical principles of classification in the life sciences.

Price at Amazon used to be 128,39 €

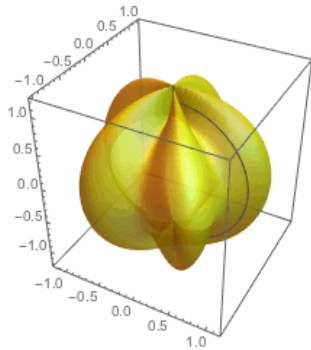


**Fig. 10.1:** Springer edition (2023).

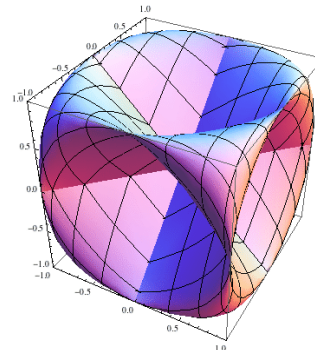
# Multi-images Environment (1)



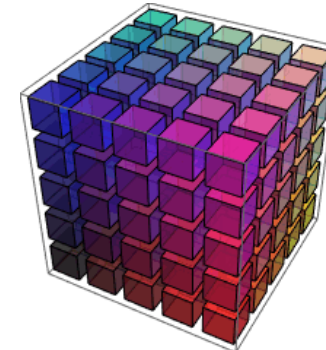
**Fig. 11.1:** Math001.



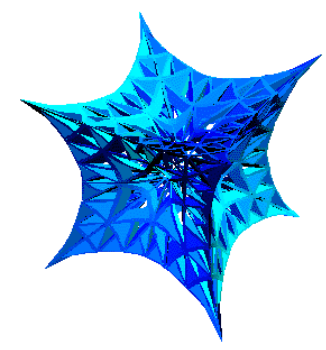
**Fig. 11.2:** Math002.



**Fig. 11.3:** Math003.

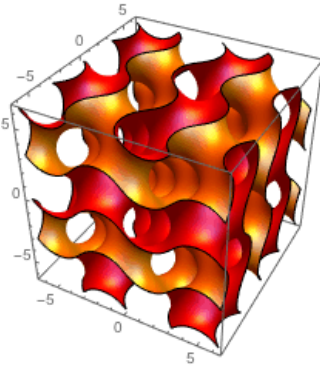


**Fig. 11.4:** Math004.

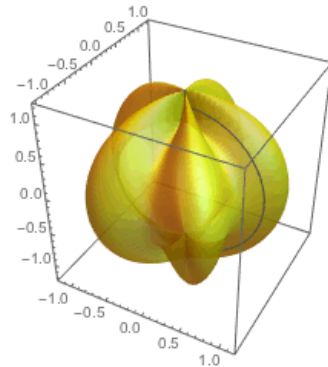


**Fig. 11.5:** Math005.

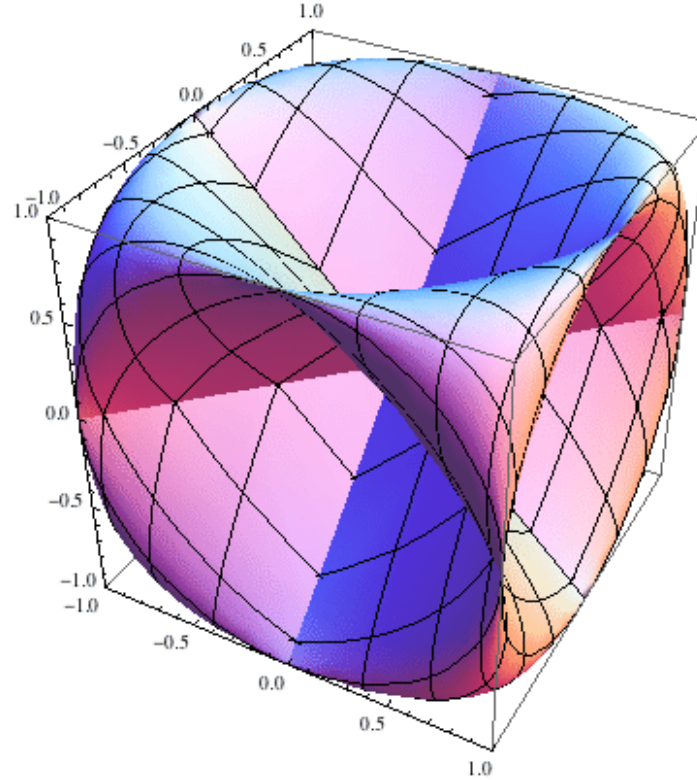
# Multi-images Environment (2)



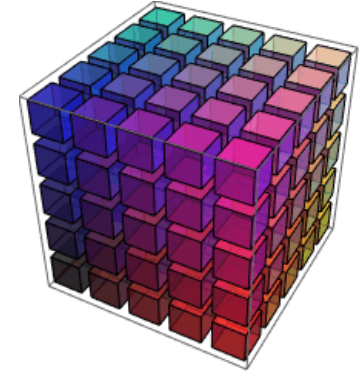
**Fig. 12.1:** Math001.



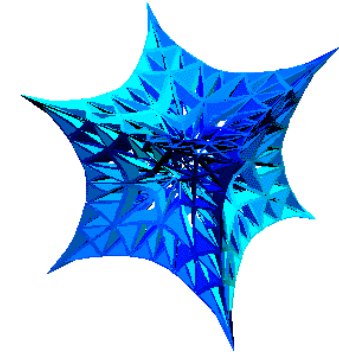
**Fig. 12.2:** Math002.



**Fig. 12.3:** Math003.



**Fig. 12.4:** Math004.



**Fig. 12.5:** Math005.

# Figures and caption in *multicolumn*



**Fig. 13.1:** God Zeus



**Fig. 13.2:** Afrodite



**Fig. 13.3:** Dionísio



**Fig. 13.4:** Era

# Ordered and unordered lists

1. First object in list;
2. Second object in list;
3. Third object in list;
  - i. First object in sublist;
  - ii. Second object in sublist;
    - a. Another level;
    - b. Yet another item.
  - iii. Third object in sublist.
4. Fourth object in List.

- First object in list;
- Second object in list;
- Third object in list;
  - First object in sublist;
  - Second object in sublist;
    - Another level;
    - Yet another item.
  - Third object in sublist;
- Fourth object in List;

# Tables

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Organizing data with tables in Markdown

# Renaissance painters

Painter	Country	Birth Year	Death Year	Most Famous Work
Albrecht Dürer	Germany	1471	1528	<i>Melencolia I</i>
Leonardo da Vinci	Italy	1452	1519	<i>Mona Lisa</i>
Michelangelo	Italy	1475	1564	<i>Sistine Chapel Ceiling</i>
Raphael	Italy	1483	1520	<i>The School of Athens</i>
Titian	Italy	~1488	1576	<i>Assumption of the Virgin</i>

**Table 16.1:** Renowned Renaissance painters with biographical data and masterpieces (alphabetical order).



# Programming languages

Language	Creator(s)	Year	Main Paradigm(s)
C	<i>Dennis Ritchie</i>	1972	Structured, Procedural
C++	<i>Bjarne Stroustrup</i>	1983	Object-oriented, multi-paradigm
Erlang	<i>Joe Armstrong</i>	1986	Funcional, Concorrente
Haskell	<i>Comitê Haskell</i>	1990	Purely Functional
Java	<i>James Gosling</i>	1995	Object-Oriented
Pascal	<i>Niklaus Wirth</i>	1970	Structured, Procedural
Python	<i>Guido van Rossum</i>	1991	Multi-paradigm (OO, Procedural, Functional)

**Table 17.1:** List of programming languages.

# Mathematical Formulations

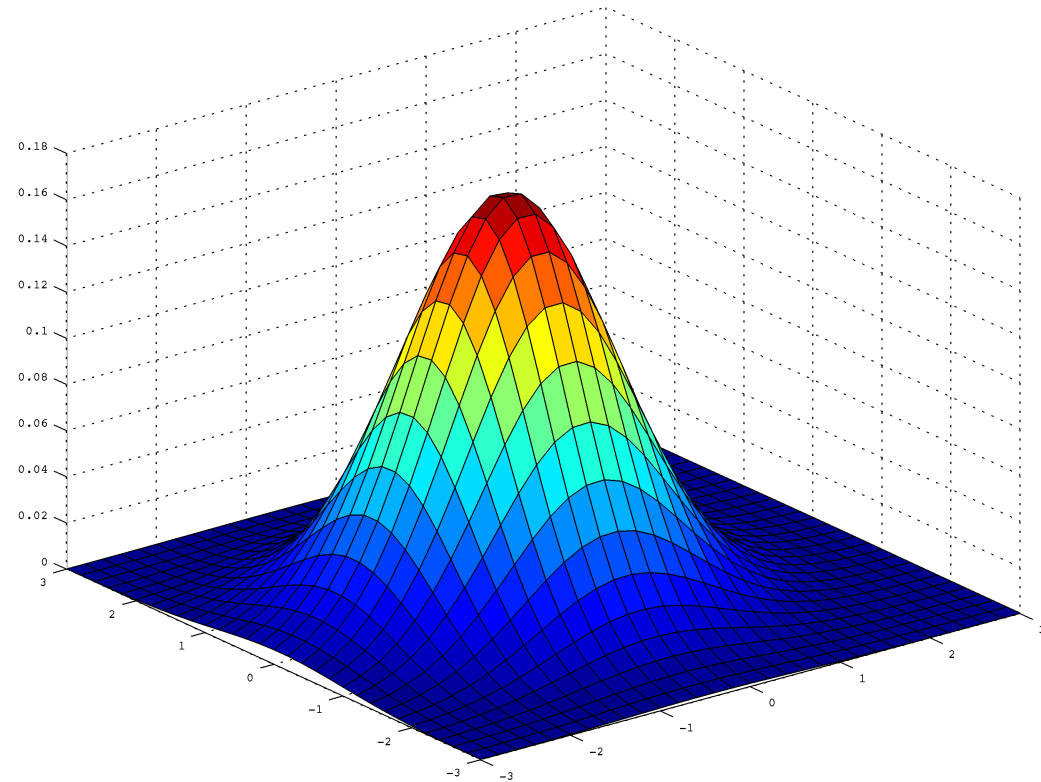
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Writing equations with LaTeX

# Probability Distribution (1)

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left(-\frac{(x - \mu)^2}{2\sigma^2}\right)$$

**Fig. 19.1:** Normal Distribution (Gaussian).

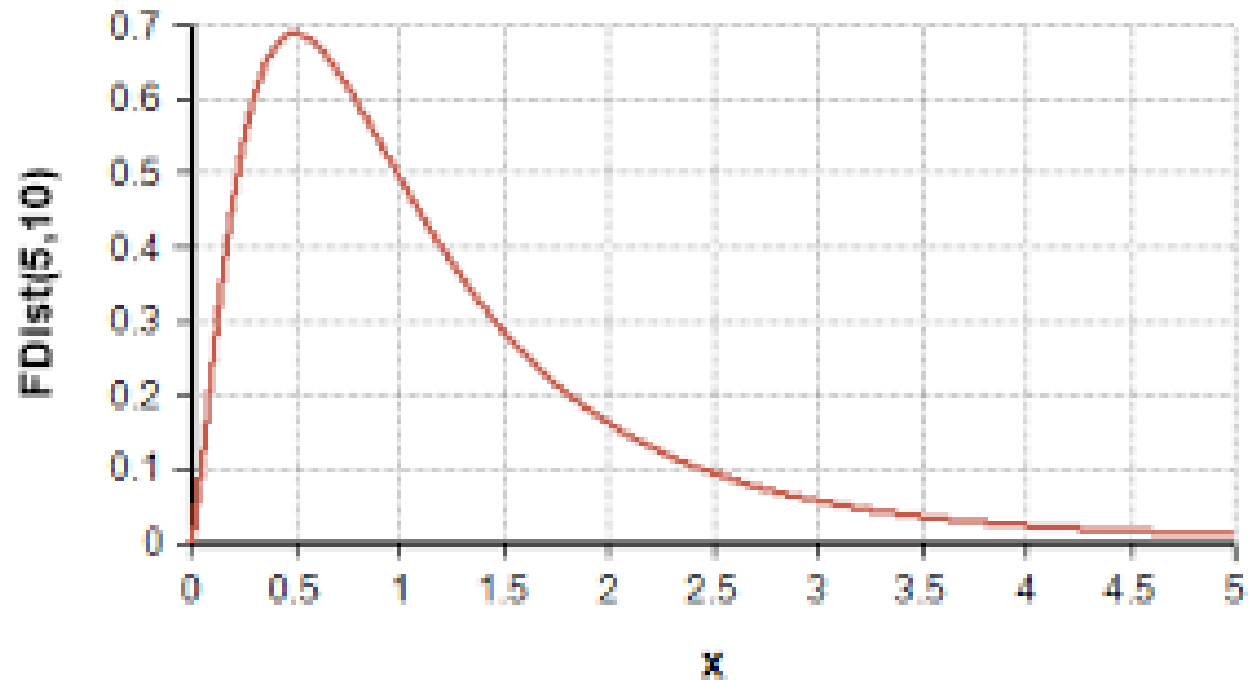


**Fig. 19.2:** Multivariate Normal Distribution.

# Probability Distribution (2)

$$f(x) = \frac{\sqrt{\frac{(d_1 x)^{d_1} d_2^{d_2}}{(d_1 x + d_2)^{d_1 + d_2}}}}{x B\left(\frac{d_1}{2}, \frac{d_2}{2}\right)}$$

**Fig. 20.1:** Fisher-Snedecor F distribution.



**Fig. 20.2:** Multivariate Normal Distribution.

# Electromagnetic Field (Differential form)

Below, in modern vector notation, in *differential form*, are Maxwell's four equations governing the **electromagnetic field**.

$$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$$

(Gauss's law)

$$\nabla \cdot \mathbf{B} = 0$$

(No magnetic monopoles)

$$\nabla \times \mathbf{E} = - \frac{\partial \mathbf{B}}{\partial t}$$

(Faraday-Lenz law)

$$\nabla \times \mathbf{B} = \mu_0 \mathbf{J} + \mu_0 \epsilon_0 \frac{\partial \mathbf{E}}{\partial t}$$

(Ampere-Maxwell Law)

# Electromagnetic Field (Integral form)

Below, in modern vector notation, in *integral form*, are Maxwell's four equations governing the electromagnetic field.

$$\oint_{\Sigma} \mathbf{E} \cdot d\mathbf{S} = \frac{Q_{\text{enc}}}{\epsilon_0} \quad (\text{Gauss's law})$$

$$\oint_{\Sigma} \mathbf{B} \cdot d\mathbf{S} = 0 \quad (\text{No magnetic monopoles})$$

$$\oint_{\partial\Sigma} \mathbf{E} \cdot d\mathbf{l} = - \frac{d}{dt} \int_{\Sigma} \mathbf{B} \cdot d\mathbf{S} \quad (\text{Faraday-Lenz law})$$

$$\oint_{\partial\Sigma} \mathbf{B} \cdot d\mathbf{l} = \mu_0 I_{\text{enc}} + \mu_0 \epsilon_0 \frac{d}{dt} \int_{\Sigma} \mathbf{E} \cdot d\mathbf{S} \quad (\text{Ampere-Maxwell Law})$$

# Python programs

```
"""
O programa traça, em 2D, os perfis instantâneos do
campo elétrico E (y) e do campo magnético B (z),
ambos perpendiculares ao eixo de propagação x.
"""
import numpy as np
import matplotlib.pyplot as plt

# Constantes e parâmetros
c = 3e8
E0 = 1.0
lambda_ = 1.0
k = 2 * np.pi / lambda_
omega = 2 * np.pi * c / lambda_
x = np.linspace(0, 2 * lambda_, 1000)
t = 0
E = E0 * np.sin(k * x - omega * t)
B = (E0 / c) * np.sin(k * x - omega * t)
B_scaled = c * B # para visualização

plt.plot(x, E, label='E(x, t=0)')
plt.plot(x, B_scaled, label='c·B(x, t=0)')
plt.xlabel('x (m)')
plt.ylabel('Amplitude (u.a.)')
plt.title('Propagação de onda eletromagnética no vácuo (instantâneo)')
plt.legend()
plt.grid(True)
plt.show()
```

Fig. 23.1: First program.

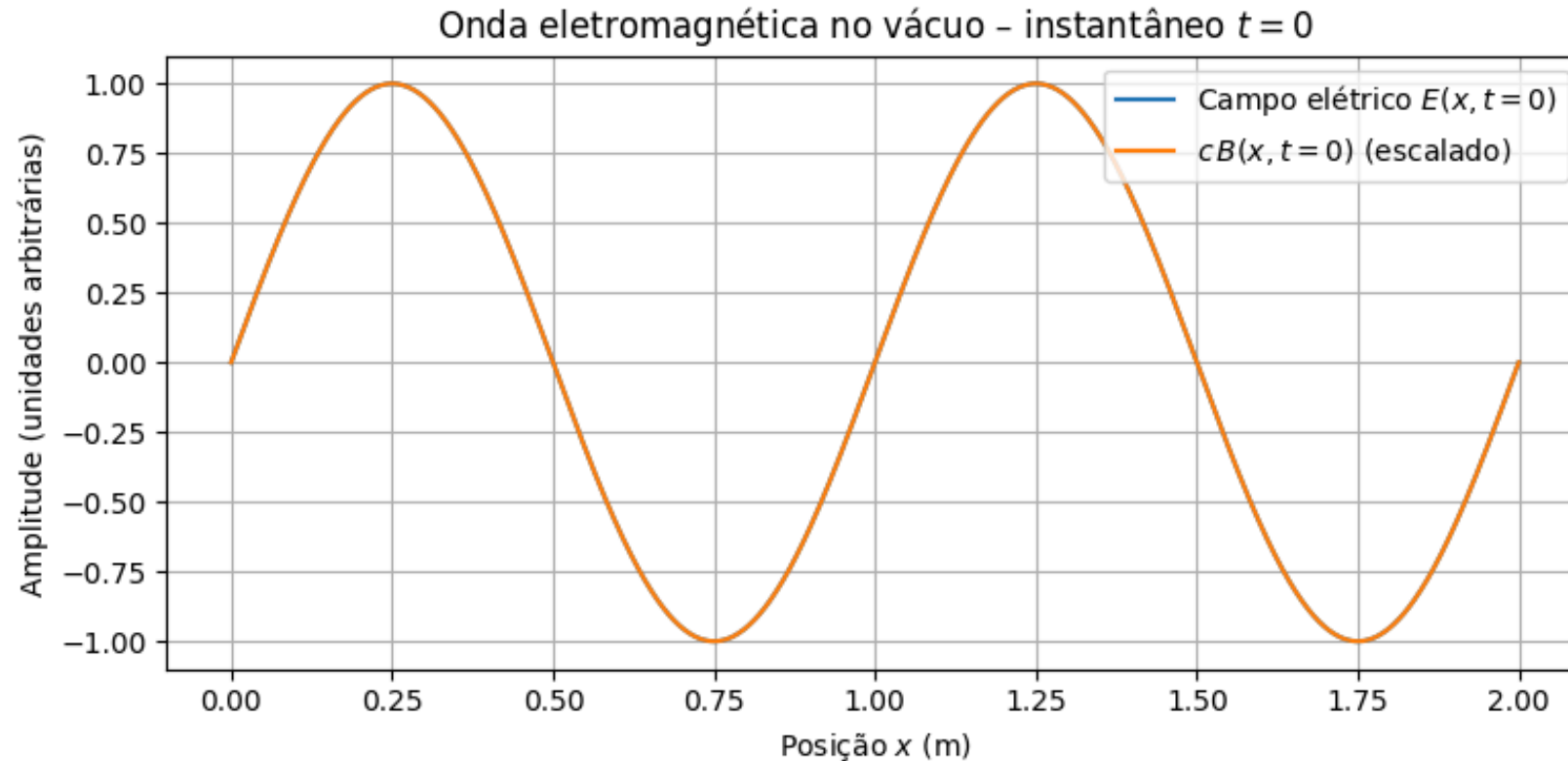
```
import numpy as np
import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D # registra o proj. 3-D

# ----- parâmetros físicos -----
c = 3.0e8 # velocidade da luz (m s-1)
E0 = 1.0 # amplitude arbitrária do campo elétrico (V m-1)
lam = 1.0 # comprimento de onda (m)
k = 2*np.pi/lam # número de onda
omega = 2*np.pi*c/lam # frequência angular
# domínios espacial e temporal
x = np.linspace(0, 2*lam, 1000) # duas ondas completas
t = 0.0 # instante “congelado”
# ----- campos E e B -----
E = E0 * np.sin(k*x - omega*t) # componente em y
B = (E0/c) * np.sin(k*x - omega*t) # componente em z (antes do escalonamento)
B_plot = c * B # escala-se por c para comparar a E
# ----- figura 3-D -----
fig = plt.figure(figsize=(8, 4))
ax = fig.add_subplot(111, projection='3d')

# linha do campo elétrico: (x, E, 0)
ax.plot(x, E, np.zeros_like(x), label='E(x, t=0)')
# linha do campo magnético escalonado: (x, 0, c B)
ax.plot(x, np.zeros_like(x), B_plot, label='c·B(x, t=0)')
# rótulos e estética
ax.set_xlabel('x (m)')
ax.set_ylabel('E (V/m)')
ax.set_zlabel('c·B (V/m)')
ax.set_title('Propagação de uma onda eletromagnética no vácuo (instantâneo 3-D)')
ax.legend()
plt.tight_layout()
plt.show()
```

Fig. 23.2: Second program.

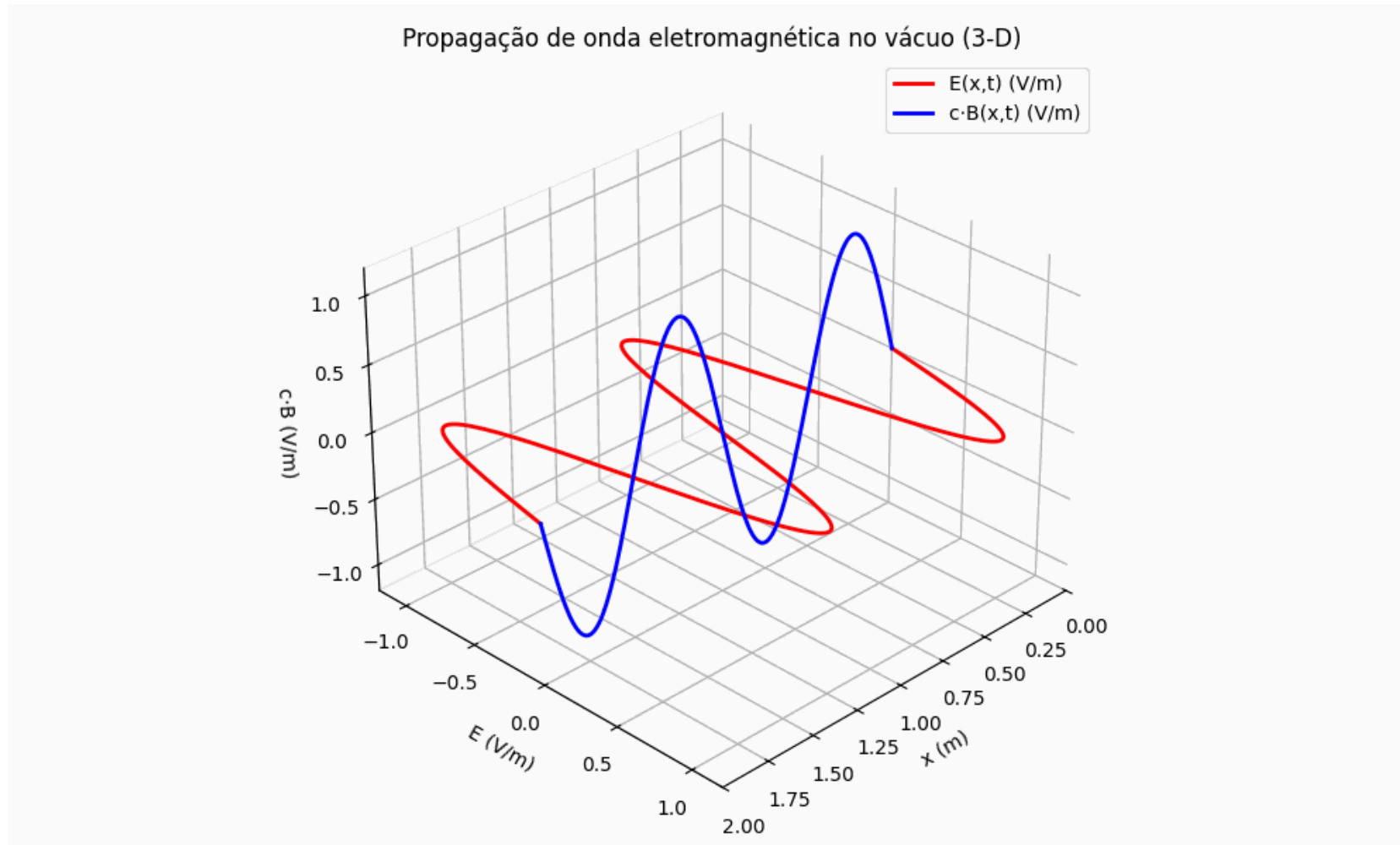
# Electromagnetic wave propagation (1)



**Fig. 24.1:** Result of the 3D rendering of the program `electromag-plot01.py`.



# Electromagnetic wave propagation (2)



**Fig. 25.1:** 3D animation of an electromagnetic wave propagation.

# Quotes

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**Special text deserves special space**

"There is an *increasing* demand of current information systems to incorporate the use of a higher degree of formalism in the development process. *Formal Methods* consist of a set of tools and techniques based on mathematical model and formal logic that are used to *specify and verify* requirements and designs for hardware and software systems."

**"There is an increasing demand of current information systems to incorporate the use of a higher degree of formalism in the development process. Formal Methods consist of a set of tools and techniques based on mathematical model and formal logic that are used to specify and verify requirements and designs for hardware and software systems."**

# Appendix

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**Bibliography, References, Appendix. etc.**

# Appendix 1 - Special Sections (1)

CSS Section	Description/Purpose	Markdown Class (example)
section.title	Title slide	<code>&lt;!-- _class: title --&gt;</code>
section.title-bg	Title slide with background	<code>&lt;!-- _class: title-bg --&gt;</code>
section.chapter	Chapter slide	<code>&lt;!-- _class: chapter --&gt;</code>
section.chapter-alt	Alternative chapter	<code>&lt;!-- _class: chapter-alt --&gt;</code>
section.agenda	Agenda/content slide	<code>&lt;!-- _class: agenda --&gt;</code>
section.end	Thank you slide	<code>&lt;!-- _class: end --&gt;</code>
section.end-bg	Thank you with background	<code>&lt;!-- _class: end-bg --&gt;</code>
section.copyright	Copyright slide	<code>&lt;!-- _class: copyright --&gt;</code>
section.logos	Slide with additional logos	<code>&lt;!-- _class: logos --&gt;</code>

**Table 30.1:** List of tags used (1).

# Appendix 1 - Special Sections (2)

CSS Section	Description/Purpose	Markdown Class (example)
section.blank	Blank slide	<code>&lt;!-- _class: blank --&gt;</code>
section.nobrand	Slide without branding	<code>&lt;!-- _class: nobrand --&gt;</code>
section.multicolumn	Slide with multiple columns	<code>&lt;!-- _class: multicolumn --&gt;</code>
section.multicolumn vcenter	Vertically centered IN multiple columns	<code>&lt;!-- _class: multicolumn vcenter --&gt;</code>
section.grid-tlr	Grid: top, left, right	<code>&lt;!-- _class: grid-tlr --&gt;</code>
section.grid-lrb	Grid: left, right, bottom	<code>&lt;!-- _class: grid-lrb --&gt;</code>
section.quote	Quote slide (unified quote)	<code>&lt;!-- _class: quote --&gt;</code>
section.quote.dark	Alternative quote (formerly quote2)	<code>&lt;!-- _class: quote dark --&gt;</code>
section.references	References/bibliography slide	<code>&lt;!-- _class: references --&gt;</code>

**Table 31.1:** List of tags used (2).

# References

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**Back to the**

**Beginning**