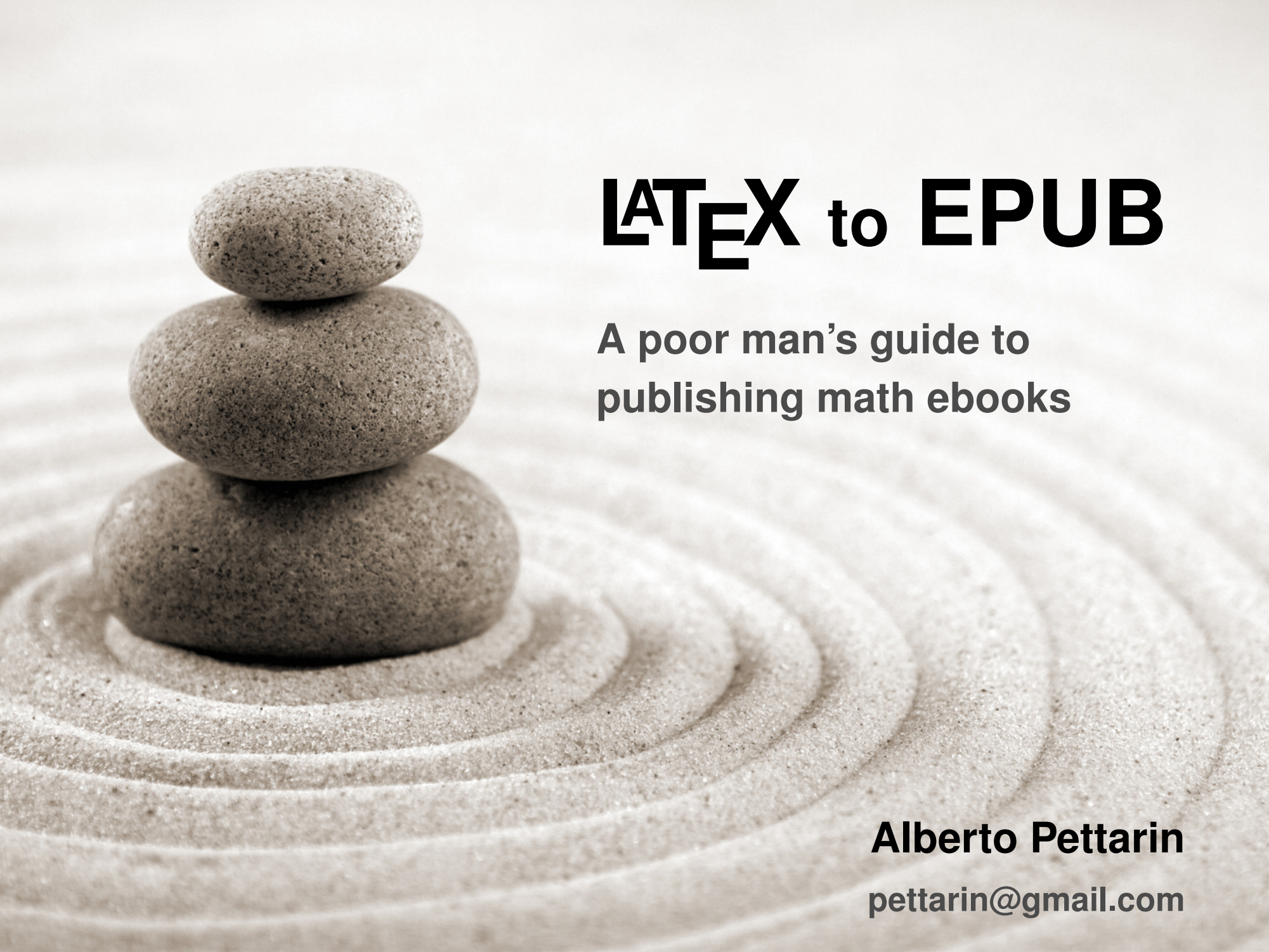


LaTeX to EPUB

A poor man's guide to publishing math ebooks

Alberto Pettarin

pettarin@gmail.com

A Talk Title, Explained

LaTeX to EPUB

A poor man's guide to publishing math ebooks

A Talk Title, Explained

LaTeX to EPUB

A poor man's guide to publishing math ebooks

- Easy-to-use interface to TeX high-quality typesetter
- Semantic-oriented markup language (`\chapter{Introduction}`, `\begin{quote}...\end{quote}`)
- Widely used in science and engineering

A Talk Title, Explained

LaTeX to EPUB

A poor man's guide to publishing math ebooks

- Open ebook standard by IDPF
- EPUB 3.0 published on Oct 11 2011
- EPUB file = ZIP[(X)HTML + CSS + metadata]
- Main format on the market (except Amazon Kindle)

A Talk Title, Explained

LaTeX to EPUB

A poor man's guide to publishing math ebooks

- Scientific Technical Medical (STM) contents
- Notes, pre-prints, journals, magazines, books, ...
- Math notation: single symbols (z, A, Φ, $\in$, $\emptyset$, $\bigcup$), short expressions ($y = ax^2 + bx + c$), complex formulas:

$$\Pi^S \mathbf{F}(\mathbf{r}) = \frac{1}{4\pi} \nabla \times \int_V \frac{\nabla' \times \mathbf{F}(\mathbf{r}')}{|\mathbf{r} - \mathbf{r}'|} dV'$$

A Talk Title, Explained

LaTeX to EPUB

A poor man's guide to publishing math ebooks

- Goal: LaTeX document $\Rightarrow$ EPUB ebook
- No manual editing of LaTeX source files
- Easy-to-use, free software tool(chain)

A Talk Title, Explained

LaTeX to EPUB

A poor man's guide to publishing math ebooks

- Goal: LaTeX document $\Rightarrow$ EPUB ebook
- No manual editing of LaTeX source files
- Easy-to-use, free software tool(chain)
- BTW, massive business opportunity here...

In this Talk. . .

- EPUB 3.0: What's New?
- LaTeX in a Nutshell
- Converting LaTeX to (X)HTML
- (Sad) Conclusions

In this Talk. . .

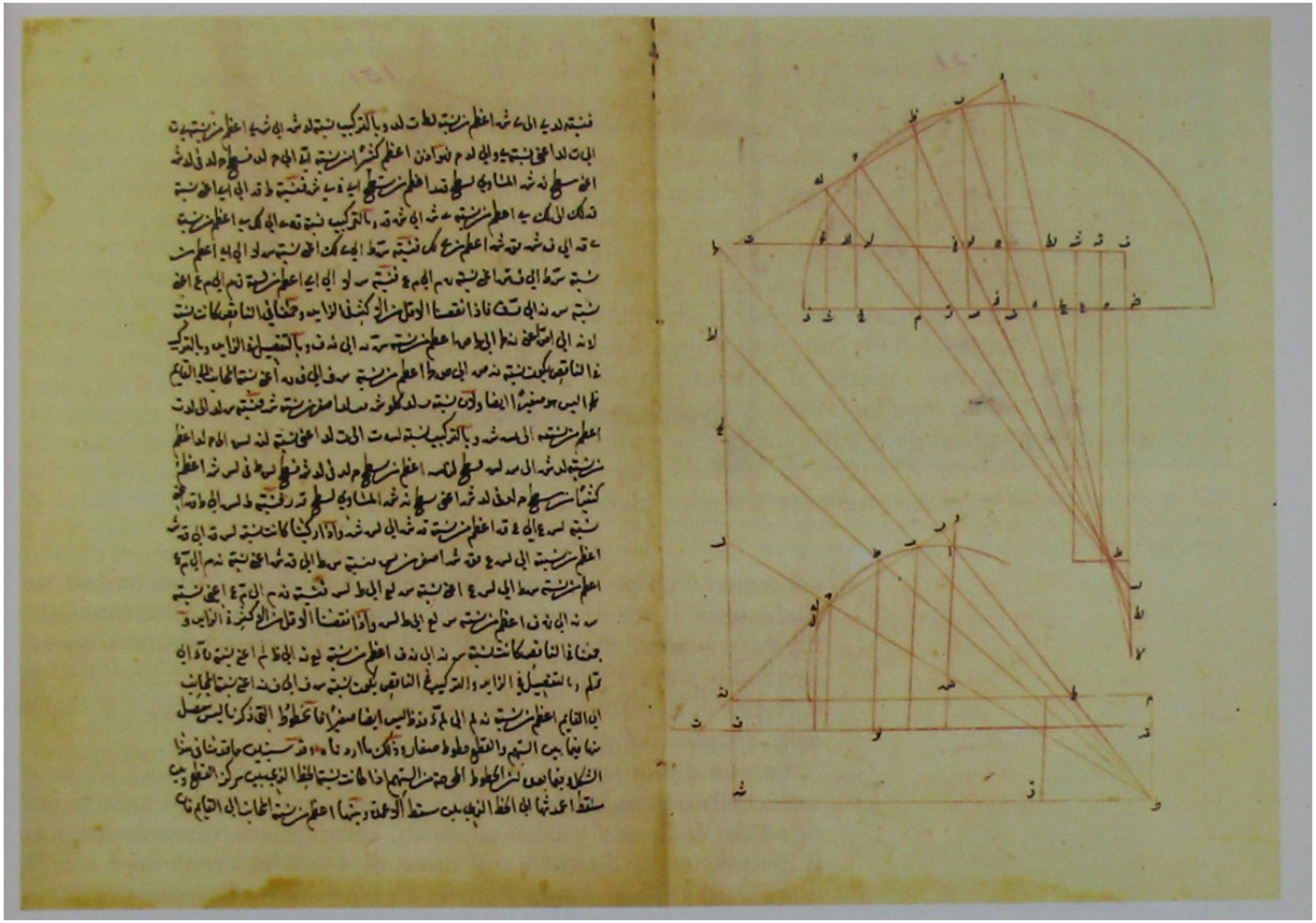
- EPUB 3.0: What's New?
- LaTeX in a Nutshell
- Converting LaTeX to (X)HTML
- (Sad) Conclusions
- Good News

  (Don't fall asleep!)

STM Literature

Rhind Papyrus, ca. 1650 BC

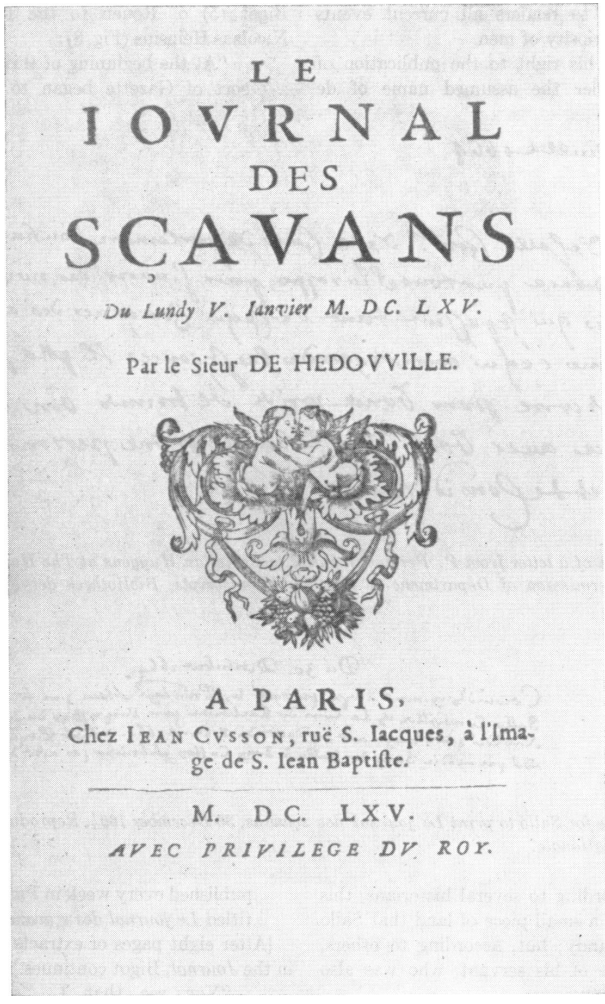
Arabic Transcript of Apollonius' Conics, ca. 1100



Gutenberg's Printing Press, ca. 1440

First “Scientific” Journals, 1665

- Journal des Sçavans
- Philosophical Transactions of the Royal Society



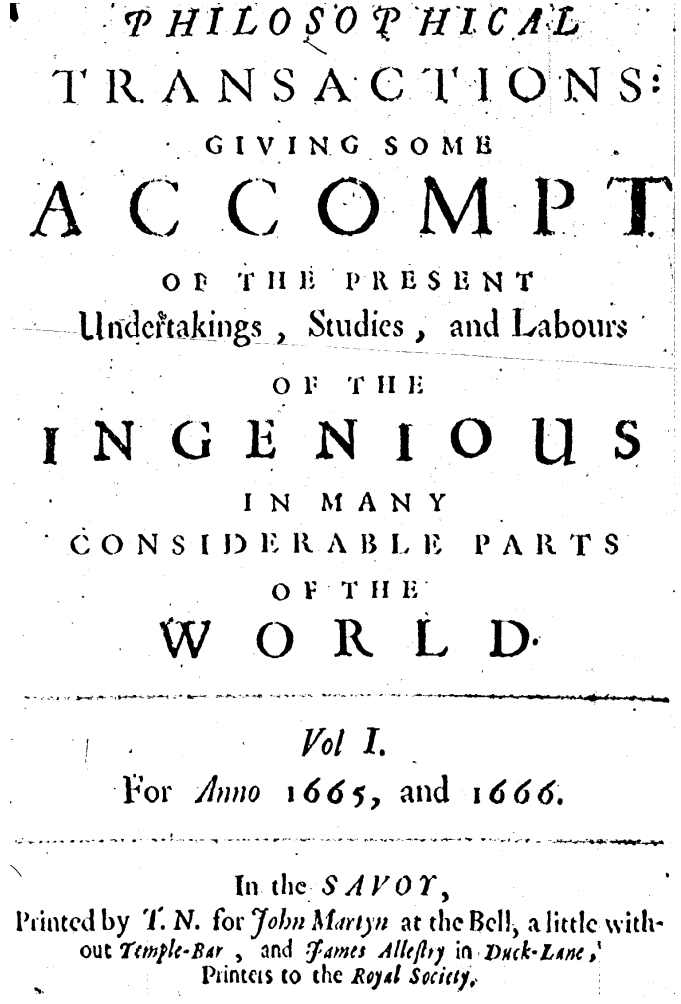
LE
IOVRNAL
DES
SCAVANS

Du Lundy V. Ianvier M. DC. LXV.

Par le Sieur DE HEDOVVILLE.

A PARIS,
Chez IEAN CVSSON, ruë S. Iacques, à l'Image de S. Iean Baptiſte.

M. DC. LXV.
AVEC PRIVILEGE DV ROY.



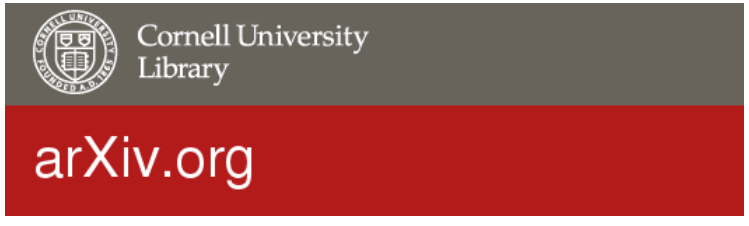
PHILOSOPHICAL
TRANSACTIONS:
GIVING SOME
ACCOMPT
OF THE PRESENT
Undertakings, Studies, and Labours
OF THE
INGENIOUS
IN MANY
CONSIDERABLE PARTS
OF THE
WORLD.

Vol I.
For *Anno* 1665, and 1666.

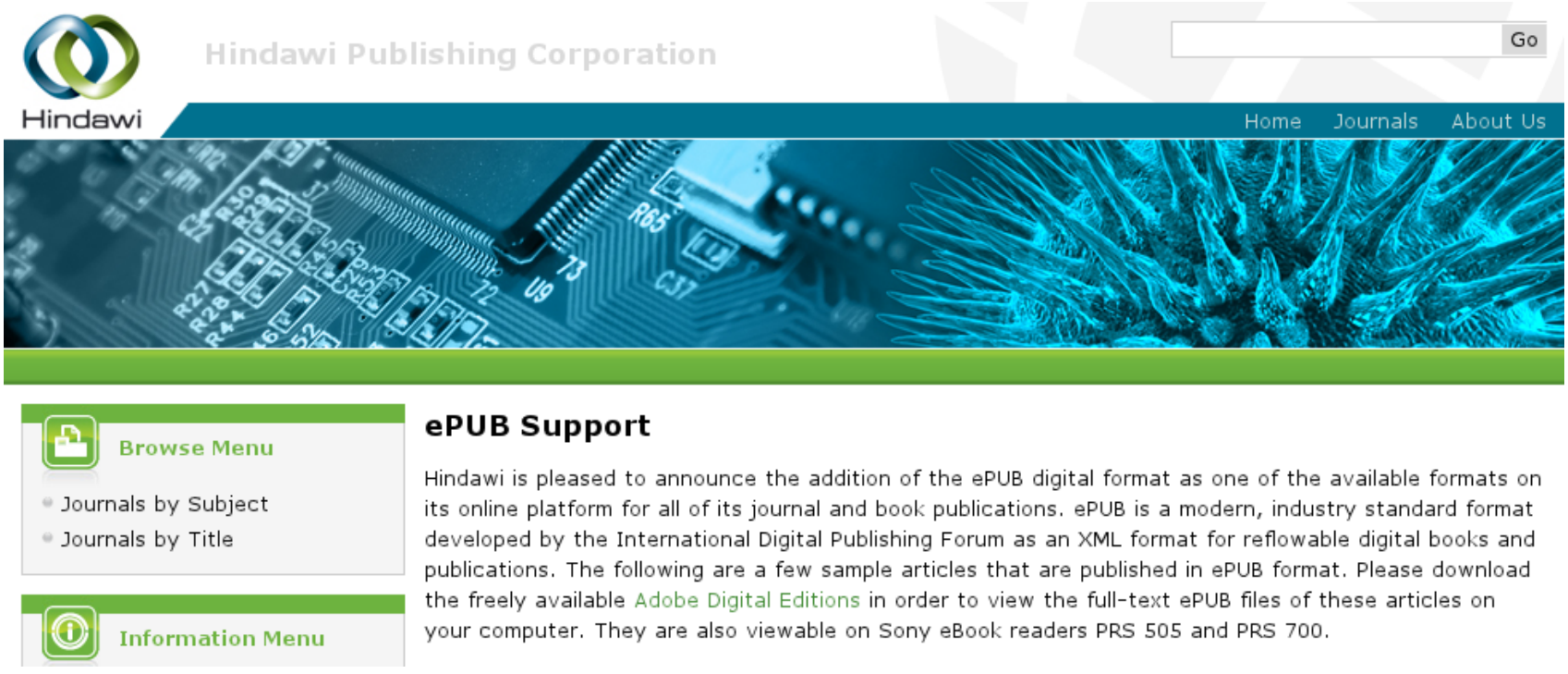
In the *SAVOY*,
Printed by *T. N.* for *John Martyn* at the Bell, a little without *Temple-Bar*, and *James Allestry* in *Duck-Lane*,
Printers to the *Royal Society*.

First Open-Access Journals, 1990-1991

Bryn Mawr Classical Review BMCR



Articles in EPUB Format, 2008



EPUB 3.0

EPUB 3.0: What's New?

<idpf> International Digital Publishing Forum
Trade and Standards Organization for the Digital Publishing Industry

About Us | Membership | EPUB | News and Events | Contact Us

EPUB 3 Becomes Final IDPF Specification

OCTOBER 10, 2011

Frankfurt, Germany, October 11, 2011. The International Digital Publishing Forum (IDPF) today announced the completion of a major revision to EPUB, the global standard interchange and delivery format for eBooks and other digital publications. The IDPF membership unanimously voted to elevate EPUB 3.0 to a final IDPF Recommended Specification, publicly available at http://idpf.org/epub/30.

- Document content written in (X)HTML5
- W3C Presentation MathML 3.0 support is required
- JavaScript ($\Rightarrow$ MathJax display engine) support is optional

Writing $x^2 + 4x + 8$ in Two MathML Flavors

Presentation

```
<mrow>
  <msup>
    <mi>x</mi>
    <mn>2</mn>
  </msup>
  <mo>+</mo>
  <mrow>
    <mn>4</mn>
    <mo>&InvisibleTimes;</mo>
    <mi>x</mi>
  </mrow>
  <mo>+</mo>
  <mn>8</mn>
</mrow>
```

Content

```
<apply>
  <plus/>
    <apply>
      <power/>
        <ci>x</ci>
        <cn>2</cn>
    </apply>
    <apply>
      <times/>
        <cn>4</cn>
        <ci>x</ci>
    </apply>
    <cn>8</cn>
</apply>
```

EPUB 3.0: the Killer Format?

Game over?

EPUB 3.0: the Killer Format?

Game over?

Probably yes. . .

EPUB 3.0: the Killer Format?

Game over?

Probably yes. . .

. . . but not immediately

Why

Deferring Problems

Most STM contents are not created in (X)HTML

- TEX and friends
- Markdown
- reStructuredText
- Wiki markup
- DocBook XML
- OpenDocument XML
- Generic XML
- ...

Deferring Problems

Most STM contents are not created in (X)HTML

- TEX and friends
- Markdown
- reStructuredText
- Wiki markup
- DocBook XML
- OpenDocument XML
- Generic XML
- ...

Legacy issues

Will the current ebook readers be updated to support EPUB 3.0 ?

LaTeX in a Nutshell

LaTeX: Main Features

- "Lingua franca" in (many) scientific and technical domains
- Free software (LPPL license) and huge ($\approx$ 1M) user base
- Markup language created by Lamport on top of Knuth's TeX
- Ideally, semantic-oriented (`\section{Experiments}`)
- Plenty of default commands (`\emph`) and environments (`\begin{itemize}...\end{itemize}`)...
- ...that can be modified/extended by users

ESTIMATES FOR THE VOLUME OF A LORENTZIAN MANIFOLD

CLAUS GERHARDT

Abstract. We prove new estimates for the volume of a Lorentzian manifold and show especially that cosmological spacetimes with crushing singularities have finite volume.

0. Introduction

Let N be a $(n+1)$-dimensional Lorentzian manifold and suppose that N can be decomposed in the form

$$N = N_0 \cup N_- \cup N_+, \tag{0.1}$$

where N_0 has finite volume and N_- resp. N_+ represent the critical past resp. future Cauchy developments with not necessarily a priori bounded volume. We assume that N_+ is the future Cauchy development of a Cauchy hypersurface M_1, and N_- the past Cauchy development of a hypersurface M_2, or, more precisely, we assume the existence of a time function x^0, such that

$$\begin{aligned} N_+ &= {x^0}^{-1}([t_1, T_+)), & M_1 &= \{x^0 = t_1\}, \\ N_- &= {x^0}^{-1}((T_-, t_2]), & M_2 &= \{x^0 = t_2\}, \end{aligned} \tag{0.2}$$

and that the Lorentz metric can be expressed as

$$d\bar{s}^2 = e^{2\psi}\{-{dx^0}^2 + \sigma_{ij}(x^0, x)dx^i dx^j\}, \tag{0.3}$$

where $x = (x^i)$ are local coordinates for the space-like hypersurface M_1 if N_+ is considered resp. M_2 in case of N_-.

The coordinate system $(x^\alpha)_{0\le\alpha\le n}$ is supposed to be future directed, i.e. the *past* directed unit normal (ν^α) of the level sets

$$M(t) = \{x^0 = t\} \tag{0.4}$$

Date: April 18, 2002.

2000 *Mathematics Subject Classification.* 35J60, 53C21, 53C44, 53C50, 58J05.

Key words and phrases. Lorentzian manifold, volume estimates, cosmological spacetime, general relativity, constant mean curvature, CMC hypersurface.

Alt-N Technologies, Ltd
2201 East Lamar Blvd, Suite 270
Arlington, Texas 76006 USA
http://www.altn.com

Helping the World Communicate!

Sales & Tech Tips

September 2003

In this issue

Osirusoft RBL Gone!

Osirusoft, a popular antispam black list site, is offline following extended denial of service attacks. The Osirusoft listing should be removed from MDaemon's Spam Blocker:

1. Choose the *Security > Spam Blocker* command.
2. Select the *Spam Blocker Hosts* tab.
3. Click on the item containing *osirusoft* and click on *Remove*.
4. Click on *OK* to exit.

Positive Reviews!

MDaemon continues to receive positive reviews of its speed, security, low cost, easy installation and usability. It is praised for professional strength and beginner ease of use. See the review summaries, plus links to the complete reviews.

RelayFax Upgrade/Rewrite

RelayFax is being rewritten with new technology. Also, Upgrade Protection is available. See the Upgrade Protection questions in the RelayFax FAQ. Also see the RelayFaX white paper.

MDaemon 6.8 Stops Spam

Two new features — Bayesian filtering and heuristic detection — have made MDaemon 6.8 very effective at stopping spam before it reaches users.

New AntiSpam tools come included, at no additional cost, with MDaemon 6.8 PRO!

With *Bayesian filtering*, each email site decides what is spam and legitimate email by dragging and dropping examples of both into the filtering engine. The filter then compares the content of the examples to the content of new messages to separate spam from real mail. Given several hundred examples of each type, Bayesian filtering is more than 95 percent accurate on spam, with virtually zero mistakes for important email.

Heuristic spam detection uses feature-matching rules — red HTML text, for example — to identify spam. Through years of "learning" what spam (and legitimate) messages typically look like, the heuristic rules have become very reliable in separating spam from normal email.

MDaemon supports multiple means of fighting spam, including assured access through white lists.

For more information on stopping spam with MDaemon, see the *Security Tools for Spam Control* white paper, the MDaemon AntiSpam HowTos and the AntiSpam tutorial, by Ross McWilliam.

SSL How To's

The Secure Socket Layer (SSL) can protect your MDaemon email communications on the Internet by using:

- server authentication certificates
- data encryption
- personal authentication certificates

An authentication certificate resides on your server and makes sure your users are communicating with your server only.

Data encryption converts ordinary data into codes only the sender and receiver software can understand.

A personal authentication certificate resides on a client computer and verifies the identify and ownership of the client computer.

MDaemon can use SSL for its IMAP, POP, SMTP and WorldClient webmail functions.

Setting up SSL for email and webmail are individual and independent processes. See the MDaemon SSL HowTos.

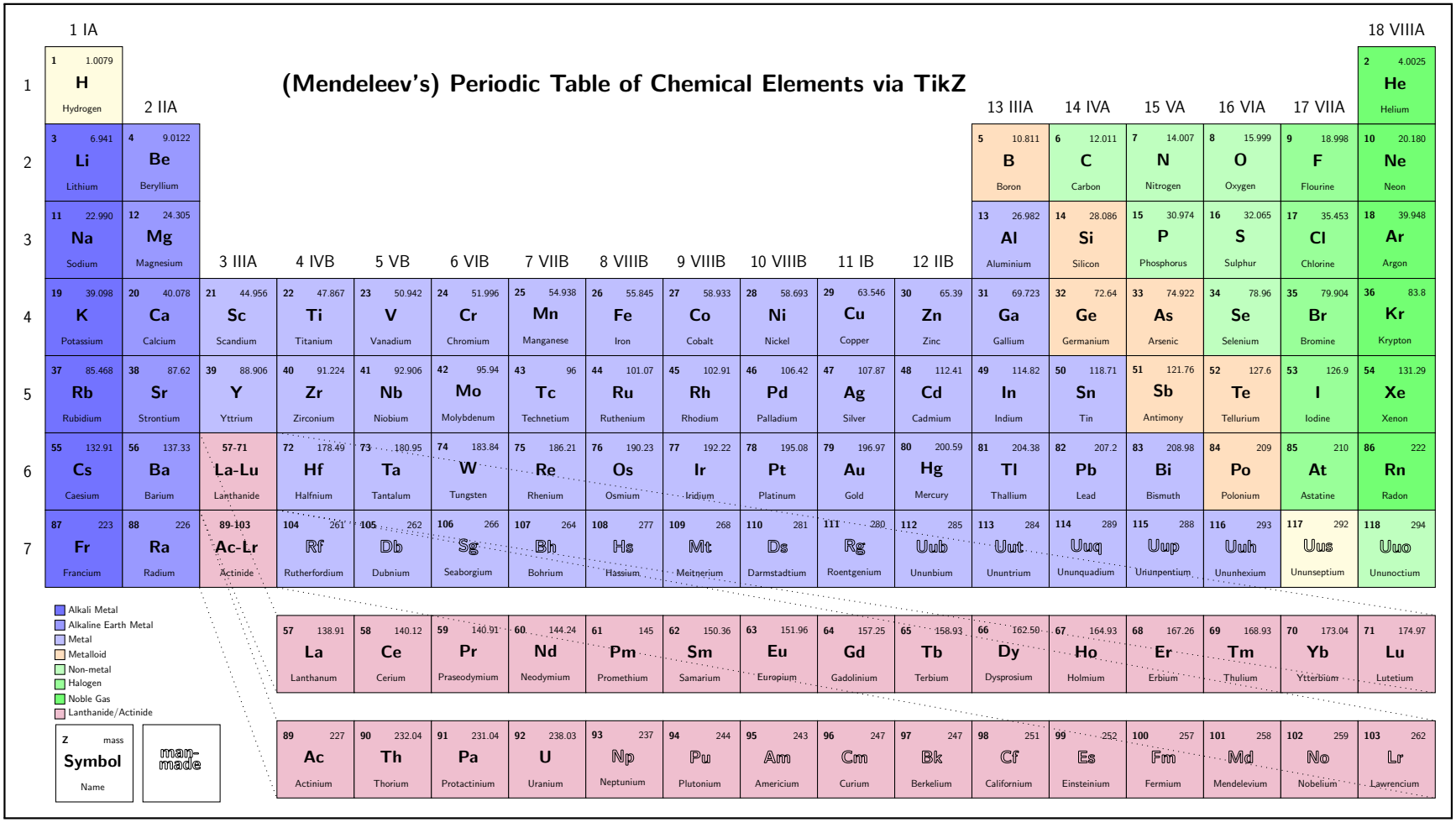
A Bohemian in Exile

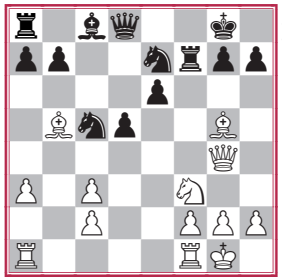
A Reminiscence

 hen, many years ago now, the once potent and extensive kingdom of Bohemia gradually dissolved and passed away, not a few historians were found to chronicle its past glories; and some have gone on to tell the fate of this or that once powerful chieftain who either donned the swallow-tail and conformed or, proudly self-exiled, sought some quiet retreat and died as he had lived, a Bohemian. But these were of the princes of the land. To the people, the villeins, the common rank and file, does no interest attach? Did they waste and pine, anæmic, in thin, strange, unwonted air? Or sit at the table of the scornful and learn, with Dante, how salt was alien bread? It is of one of those faithful commons I would speak, narrating only 'the short and simple annals of the poor.'

It is to be noted that the kingdom aforesaid was not so much a kingdom as a United States – a collection of self-ruling guilds, municipalities, or republics, bound together by a common method of viewing life. 'There *once* was a king of Bohemia' – but that was a long time ago, and even Corporal Trim was not certain in whose reign it was. These small free States, then, broke up gradually, from various causes and with varying speed; and I think ours was one of the last to go.

With us, as with many others, it was a case of lost leaders. 'Just for a handful of silver he left us'; though it was not


(Mendeleev's) Periodic Table of Chemical Elements via TikZ
1 IA
2 IIA
3 IIIA
4 IVB
5 VB
6 VIB
7 VIIB
8 VIIIB
9 VIIIB
10 VIIIB
11 IB
12 IIB
13 IIIA
14 IVA
15 VA
16 VIA
17 VIIA
18 VIIIA
1 1.0079 H Hydrogen
2 4.0025 He Helium
3 6.941 Li Lithium
4 9.0122 Be Beryllium
5 10.811 B Boron
6 12.011 C Carbon
7 14.007 N Nitrogen
8 15.999 O Oxygen
9 18.998 F Flourine
10 20.180 Ne Neon
11 22.990 Na Sodium
12 24.305 Mg Magnesium
13 26.982 Al Aluminium
14 28.086 Si Silicon
15 30.974 P Phosphorus
16 32.065 S Sulphur
17 35.453 Cl Chlorine
18 39.948 Ar Argon
19 39.098 K Potassium
20 40.078 Ca Calcium
21 44.956 Sc Scandium
22 47.867 Ti Titanium
23 50.942 V Vanadium
24 51.996 Cr Chromium
25 54.938 Mn Manganese
26 55.845 Fe Iron
27 58.933 Co Cobalt
28 58.693 Ni Nickel
29 63.546 Cu Copper
30 65.39 Zn Zinc
31 69.723 Ga Gallium
32 72.64 Ge Germanium
33 74.922 As Arsenic
34 78.96 Se Selenium
35 79.904 Br Bromine
36 83.8 Kr Krypton
37 85.468 Rb Rubidium
38 87.62 Sr Strontium
39 88.906 Y Yttrium
40 91.224 Zr Zirconium
41 92.906 Nb Niobium
42 95.94 Mo Molybdenum
43 96 Tc Technetium
44 101.07 Ru Ruthenium
45 102.91 Rh Rhodium
46 106.42 Pd Palladium
47 107.87 Ag Silver
48 112.41 Cd Cadmium
49 114.82 In Indium
50 118.71 Sn Tin
51 121.76 Sb Antimony
52 127.6 Te Tellurium
53 126.9 I Iodine
54 131.29 Xe Xenon
55 132.91 Cs Caesium
56 137.33 Ba Barium
57-71 La-Lu Lanthanide
72 178.49 Hf Halfnium
73 180.95 Ta Tantalum
74 183.84 W Tungsten
75 186.21 Re Rhenium
76 190.23 Os Osmium
77 192.22 Ir Iridium
78 195.08 Pt Platinum
79 196.97 Au Gold
80 200.59 Hg Mercury
81 204.38 Tl Thallium
82 207.2 Pb Lead
83 208.98 Bi Bismuth
84 209 Po Polonium
85 210 At Astatine
86 222 Rn Radon
87 223 Fr Francium
88 226 Ra Radius
89-103 Ac-Lr Actinide
104 261 Rf Rutherfordium
105 262 Db Dubnium
106 266 Sg Seaborgium
107 264 Bh Bohrium
108 277 Hs Hassium
109 268 Mt Meitnerium
110 281 Ds Darmstadtium
111 280 Rg Roentgenium
112 285 Uub Ununbium
113 284 Uut Ununtrium
114 289 Uuq Ununquadium
115 288 Uup Ununpentium
116 293 Uuh Ununhexium
117 292 Uus Ununseptium
118 294 Uuo Ununoctium
57 138.91 La Lanthanum
58 140.12 Ce Cerium
59 140.91 Pr Praseodymium
60 144.24 Nd Neodymium
61 145 Pm Promethium
62 150.36 Sm Samarium
63 151.96 Eu Europium
64 157.25 Gd Gadolinium
65 158.93 Tb Terbium
66 162.50 Dy Dysprosium
67 164.93 Ho Holmium
68 167.26 Er Erbium
69 168.93 Tm Thulium
70 173.04 Yb Ytterbium
71 174.97 Lu Lutetium
89 227 Ac Actinium
90 232.04 Th Thorium
91 231.04 Pa Protactinium
92 238.03 U Uranium
93 237 Np Neptunium
94 244 Pu Plutonium
95 243 Am Americium
96 247 Cm Curium
97 247 Bk Berkelium
98 251 Cf Californium
99 252 Es Einsteinium
100 257 Fm Fermium
101 258 Md Mendelevium
102 259 No Nobelium
103 262 Lr Lawrencium
Alkali Metal
Alkaline Earth Metal
Metal
Metalloid
Non-metal
Halogen
Noble Gas
Lanthanide/Actinide
Z mass
Symbol
Name
man-made


2.5

A **14. ♖fe1?!** Objektiv betrachtet wohl fragwürdig, da die folgende schwarze Springerinvasion nach e4 ein nicht ganz korrektes Qualitätsopfer erzwingt.

a **14. … ♘e4?!** Einen Zug zu früh! **15. ♖e4 de4 16. ♕e4 ♕d5 17. ♕e2 ♖f3 18. ♗e7 ♖f7** [18. … ♖f5!?] **19. ♖d1 ♕d1 20. ♕d1 ♖e7 21. ♕d8 ♔f7 22. ♕h8 h6 23. ♗e2 ±** MOUTOUSIS – DJURHUUS, Thessaloniki ol 1988 [77, 231-4(§2), 282(36)]

b **14. … e5 15. ♕g3 ♘e4 16. ♖e4 de4 17. ♘e5** [17. ♕e5 ♕d5] **17. … ♖f5 18. ♗c4 ♔f8 ∓** Und ich sehe keine befriedigende Fortsetzung für Weiß.

B **14. ♗d3! ♘c6** [14. … e5 15. ♕g3 ♘c6 16. ♖fe1 ±] **15. ♖fe1 ♗d7 16. ♕g3 ±**

14. ♕d4

14. ♗d3 ♘d3 15. cd3 ♕c7 16. ♖fe1 ♘g6 ∞ ROGERS – DEPASQUALE, Melbourne 1987 [77, 231-6(§3), 282(37)]

14. … ♕d6 15. ♗e3 ♘e4?!

In der Folge landet der Springer auf einem weniger günstigen Feld.

15. … b6 16. ♗d3 ♘f5 17. ♕e5 ♕e5 18. ♘e5 ♘e3 19. fe3 ♖f1 20. ♖f1 ♖a7 = BLATNY

16. ♗d3 ♘c6 17. ♕b6 ♘f6 18. ♘g5! ±

Der Springerzug ermöglicht den Doppelschritt des f-Bauern wonach die Schwäche der schwarzen Felder dem Weißen etwas Vorteil verspricht.

18. … ♖d7?!

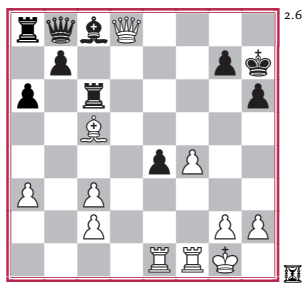
Ein sehr unglückliches Feld für den Turm. **18. … ♖f8** 19. f4 [19. ♗c5 ♕d8] 19. … h6 [19. … ♕d8 20. ♖ae1 ±] 20. ♗c5! [20. ♘f3 ♘d7 21. ♕b1 ♘c5! (21. … e5 22. fe5 ♘de5 23. ♘e5 ♖f1 24. ♕f1 ♕e5 25. ♖e1 ±; 21. … b5!?] 20. … ♕d8 21. ♘f3 ±

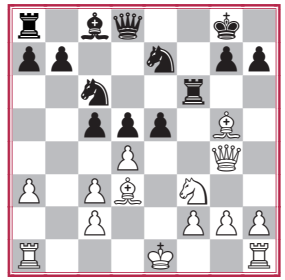
19. f4 h6?!

Verliert einfach einen Bauern.

20. ♗c5 ♕b8 21. ♘e6 ♘e4 22. ♗e4 de4 23. ♖ae1 ♖f7 24. ♘d8 ♖f6 25. ♘c6 ♖c6 26. ♕d8 ♔h7

(▩ 2.6)


2.6



1. e4 e6 2. d4 d5 3. ♘c3 ♗b4 4. e5 c5 5. a3 ♗c3 6. bc3 ♘e7 7. ♕g4 0–0

8. ♘f3 ♘bc6 9. ♗d3 f5 10. ef6 ♖f6 11. ♗g5

11. … e5!

11. … e5! *Tabelle 8*

§	12	13	14	15	16	17	18	19	20	21	
1	♕g3?! ♖f3	gf3[1] c4	♗e2[2] ed4	0–0?[3] ♗f5[4]	♖fe1[5] dc3	♗f1[6] ♕d7	♗e7 ♘e7	♕e5 ♘c6	♕c3 b5		∓
2	… …	… …	… …	♗f6! ♕f8	♗d4 ♘f5	♕g5[7] ♘fd4	cd4 ♗f5	c3 ♖e8	♖a2 ♖e6	h4[8]	∞
3	… …	… …	… ♕a5!	♗d2 ♘f5	♕g5 ed4![9]	cd4 c3	♗e3 ♘cd4	♗d4[10] ♘d4	♖g1 g6	♕e5 ♕c5![11]	∓
4	♕h4 e4	♗f6 gf6	♕f6 ♕f8!?	♕f8[12] ♔f8	dc5![13] ef3	gf3 ♗f5	♖b1 b6[14]	♗f5 ♘f5	cb6 ab6	♖b6 ♘fe7	=
5	… …	… …	… ed3	cd3[15] ♗f5!?	0–0 ♗d3[16]	♖fe1 ♘g6	♕e6 ♔g7[17]	dc5			∞
6	… …	… …	… …	… cd4!	♘d4[18] ♘d4	♕d4 ♗f5	0–0 ♘c6	♕e3[19] d4	cd4 ♕d4	♖fd1[20] ♖d8[21]	∞
7	… …	… …	… …	… …	… …	… ♘c6!	♕e3[22] d4	cd4[23] ♗f5	0–0 ♕d4		∞

12. ♗h7 ♔h7 ◂▸ Tab. 9, S. 250.

من عرف ان هذا احسن فقد عرف[8] الشىء الذى هو احسن
منه الا ان تكون[9] المعرفة توهما لا يقينا فانه ان لم يعرف
الشىء الذى به قيل فيه انه احسن قد[10] يمكن ان لا[11] يكون
شىء دونه فى الحسن فيكون[12] قوله فيه انه احسن كذبا ومن
5 هذا يظهر ان الراس واليد ليست من المضاف الحقيقى فانه قد **d**
يعرف[13] ماهية كل واحد[14] منهما من حيث هما فى الجوهر على
التحصيل من غير ان يعرف الشىء الذى هو له راس ولا
الشىء الذى هو له يد قال الا ان بالجملة الحكم بالحقيقة على **e**
ما هو من المضاف من سائر المقولات وما ليس من المضاف
10 هو مما يصعب[15] ما لم يتدبر مرارا كثيرة فاما التشكك[16] فيها
فليس فيه صعوبة[17].

---

[8] *C repetit* فقد عرف ان هذا احسن ; *h* ; و *C* ; فقد *F* : قد *L* [10] — يكون *C* : تكون *F, L* [9] — ان هذا احسن فقد عرف
: يعرف *C, L, h, j* [13] — ويكون *C* : فيكون *F, L* [12] — الا *F* : ان لا *C, L* [11] — כבר, *j* 'jam'.
: التشكك *C* [16] — يضعف *C* : يصعب [15] — واحدة *F* : واحد *C, L, h* [14] — تعرف *F*
صعوبة *Ita C, F, L, h* [17] — التشكيك

Kitāb al-Maqoūlāt [Κατηγ. *p.* 8 b, 9-24]

357 ضرورة ان يكون يعلم ايضا ذلك الشى الذى هذا احسن منه محصلا فانه ليس يجوز
ان يكون انما يعلم ان هذا احسن مما دونه فى الحسن فان ذلك انما يكون توهما لا علما
وذلك انه ليس يعلم يقينا انه احسن مما هو دونه فانه ربما اتفق الا[t] يكون شئ*[t] دونه
360 فيكون قد ظهر انه واجب ضرورة متى علم الانسان احد المضافين محصلا ان يكون
[15] يعلم ايضا[t] ذلك الاخر الذى اليه اضيف محصلا. فاما الراس و اليد وكل*[t] واحد مما **d**
يجرى مجر اهما مما هى جواهر فان ماهياتها[t] انفسها قد تعرف محصلة فاما ما يضاف*[t]
اليه فليس واجبا ان يعرف وذلك انه لا سبيل الى ان يعلم على التحصيل راس من
هذا ويد من هذه فيجب من ذلك ان هذه ليست من المضاف واذ[t] لم تكن هذه من
365 [21] المضاف فقد يصح القول انه ليس جوهر من الجواهر من المضاف الا انه خليق ان **e**
يكون قد يصعب التقحم على اثبات الحكم على امثال هذه الامور ما لم تتدبّر[t] مرارا
كثيرة فاما التشكك فيها فليس مما لا درك فيه.

LECT. t : — (359) — ان لا — شيأ* — ايضا يعلم (361) — فكل* — ماهيتها (362) — تضاف*
يُتدبر (366) — واذا (364)

“Hello, World!” in LaTeX

```
\documentclass[12pt,a4paper]{article}
\usepackage{amsmath}
\title{``Hello, World!'' in \LaTeX}
\date{\today}
\newtheorem{theo}{Theorem}
\begin{document}
  \maketitle

  \section{Introduction}
  \LaTeX\ is a document preparation system for
  the \TeX\ typesetting program.

  It offers programmable desktop publishing features
  and extensive facilities for automating most aspects
  of typesetting and \emph{desktop} publishing,
  including numbering and cross-referencing, tables and
  figures, page layout, bibliographies, and much more.

  \section{A Simple Theorem}
  % This is a comment; it will not be output.
  \begin{theo}[Euler's polyhedron formula]
     Any convex polyhedron's surface
     has Euler characteristic
     \[ V - E + F = 2. \]
  \end{theo}
\end{document}
```

“Hello, World!” in LaTeX

October 18, 2011

1 Introduction

LaTeX is a document preparation system for the TeX typesetting program.

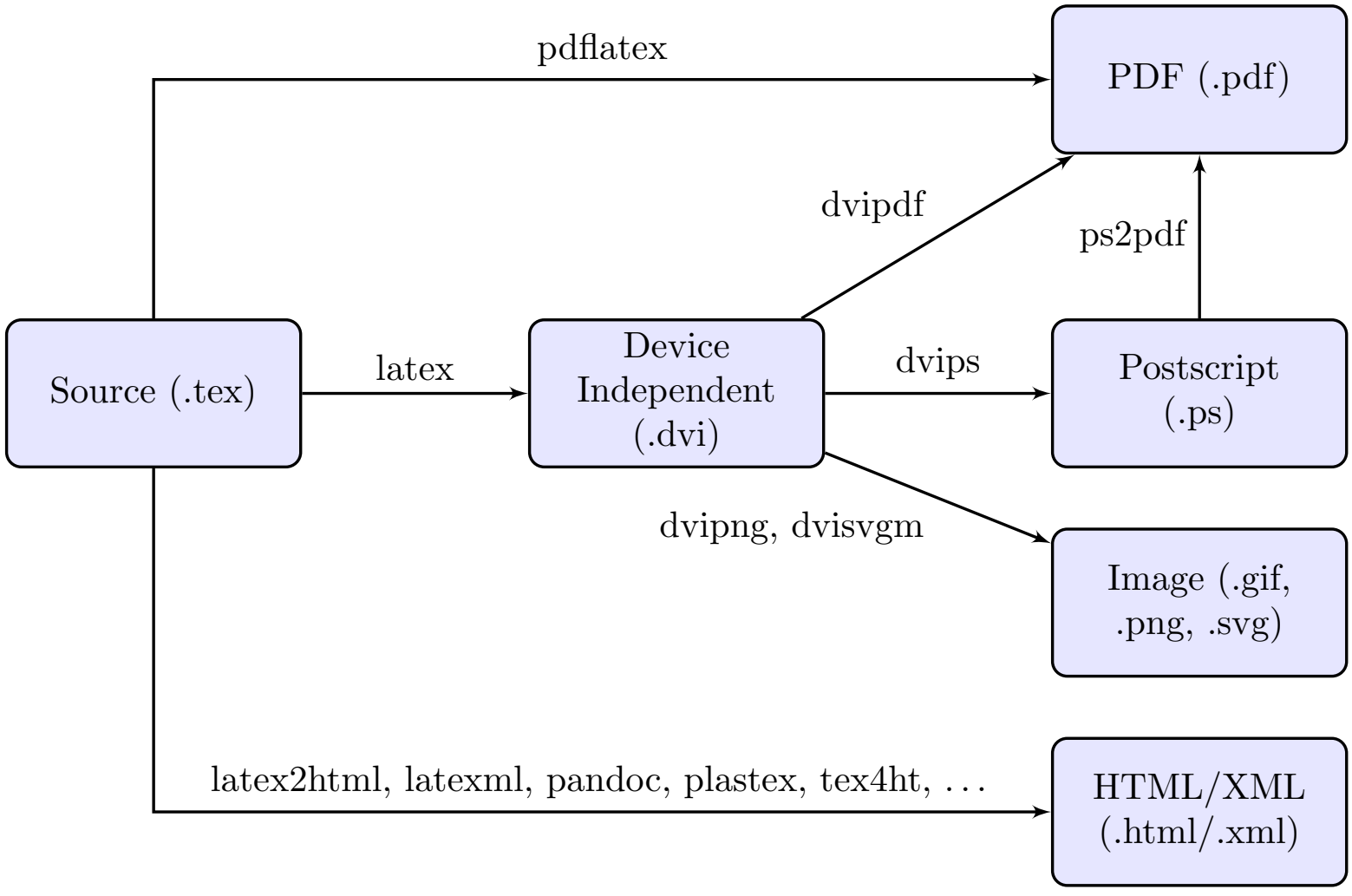
It offers programmable desktop publishing features and extensive facilities for automating most aspects of typesetting and *desktop* publishing, including numbering and cross-referencing, tables and figures, page layout, bibliographies, and much more.

2 A Simple Theorem

Theorem 1 (Euler’s polyhedron formula) *Any convex polyhedron’s surface has Euler characteristic*

$$V - E + F = 2.$$

LaTeX Workflow



LaTeX to EPUB ≡ LaTeX to (X)HTML

- EPUB = ZIP[(X)HTML + CSS + metadata]
- Key step: generating (X)HTML + CSS from LaTeX source
- Lots of tools for converting LaTeX into (X)HTML
  - HeVeA
  - HyperLaTeX
  - LaTeX2HTML
  - LaTeXML
  - pandoc
  - plasTeX
  - TeX4ht
  - ...

BRACE YOURSELF,
TROUBLES
ARE COMING

Rendering Math: Troubles, Indeed

Crucial issue

How can math objects be expressed in (X)HTML?

Rendering Math: Troubles, Indeed

Crucial issue

How can math objects be expressed in (X)HTML?

```
\[
  \sum_{k=0}^{n} k = \frac{n(n+1)}{2}
\]
```

$$\Rightarrow \quad \sum_{k=0}^{n} k = \frac{n(n+1)}{2}$$

Rendering Math: Troubles, Indeed

Crucial issue

How can math objects be expressed in (X)HTML?

```
\[
  \sum_{k=0}^{n} k = \frac{n(n+1)}{2}
\]
```

$$\Rightarrow \quad \sum_{k=0}^{n} k = \frac{n(n+1)}{2}$$

Three ways to “write” the above LaTeX formula in (X)HTML

- Converting into an image
- Using table elements and symbols
- MathML representation

Method 1: Image

Example

$$\sum_{k=0}^{n} k = \frac{n(n+1)}{2} \qquad \Rightarrow \qquad \sum_{k=0}^{n} k = \frac{n(n+1)}{2}$$

Method 1: Image

Example

$$\sum_{k=0}^{n} k = \frac{n(n+1)}{2} \quad \Rightarrow \quad \sum_{k=0}^{n} k = \frac{n(n+1)}{2}$$

Con's

- ☹ No scalability w.r.t. text
- ☹ Possibly bad quality
- ☹ Semantics gone

Pro's

- ☺ Macro-independent
- ☺ Supported by current devices

Method 2: Tables and Symbols

Example

$$\sum_{k=0}^{n} k = \frac{n(n+1)}{2} \quad \Rightarrow \quad \boxed{\boxed{\sum_{\boxed{k=0}}^{\boxed{n}} k} = \boxed{\frac{\boxed{n(n+1)}}{\boxed{2}}}}$$

Method 2: Tables and Symbols

Example

$$\sum_{k=0}^{n} k = \frac{n(n+1)}{2} \quad \Rightarrow \quad \boxed{\boxed{\sum_{\boxed{k=0}}^{\boxed{n}} k} = \boxed{\frac{\boxed{n(n+1)}}{\boxed{2}}}}$$

Con's

- ☹ Some symbols might be unavailable
- ☹ Macro-dependent
- ☹ Unwanted rendering effects

Pro's

- ☺ Scalability w.r.t. text
- ☺ Supported by current devices

Method 3: MathML

Example

$$\sum_{k=0}^{n} k = \frac{n(n+1)}{2} \quad \Rightarrow$$

```
<?xml version="1.0" encoding="UTF-8"?>
<m:math xmlns:m="http://www.w3.org/1998/Math/MathML" display="block">
  <m:mrow>
    <m:mrow>
      <m:mover>
        <m:munder>
          <m:mo movablelimits="false">&#x2211;</m:mo>
          <m:mrow>
            <m:mi>k</m:mi>
            <m:mo movablelimits="false">=</m:mo>
            <m:mn>0</m:mn>
          </m:mrow>
        </m:munder>
        <m:mi>n</m:mi>
      </m:mover>
      <m:mi>k</m:mi>
    </m:mrow>
    <m:mo>=</m:mo>
    <m:mfrac>
      <m:mrow>
        <m:mi>n</m:mi>
        <m:mo>&#x2062;</m:mo>
        <m:mfenced open="(" close=")">
          <m:mrow>
            <m:mi>n</m:mi>
            <m:mo>+</m:mo>
            <m:mn>1</m:mn>
          </m:mrow>
        </m:mfenced>
      </m:mrow>
      <m:mn>2</m:mn>
    </m:mfrac>
  </m:mrow>
</m:math>
```

Method 3: MathML

Example

$$\sum_{k=0}^{n} k = \frac{n(n+1)}{2} \quad \Rightarrow \quad \text{MathML}$$

Con's

- ☹ Not supported by current devices
- ☹ Some macros might be fragile

Pro's

- ☺ Scalability w.r.t. text
- ☺ Semantics preserved
- ☺ Required by EPUB 3.0

Note: scarce browser support, not really usable right now

(Sad) Conclusions

- Current tools (SW, devices) largely inadequate when handling maths

(Sad) Conclusions

- Current tools (SW, devices) largely inadequate when handling maths
- EPUB 3.0-compliant devices (i.e., MathML support) will create interesting dynamics (i.e., $$$) in the near future

(Sad) Conclusions

- Current tools (SW, devices) largely inadequate when handling maths
- EPUB 3.0-compliant devices (i.e., MathML support) will create interesting dynamics (i.e., $$$) in the near future
- Meanwhile, the best practices for math ebooks are:

(Sad) Conclusions

- Current tools (SW, devices) largely inadequate when handling maths
- EPUB 3.0-compliant devices (i.e., MathML support) will create interesting dynamics (i.e., $$$) in the near future
- Meanwhile, the best practices for math ebooks are:
  - Large devices (9”-10”): generate PDF, with suitable page size

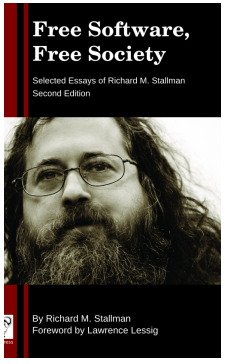
(Sad) Conclusions

- Current tools (SW, devices) largely inadequate when handling maths
- EPUB 3.0-compliant devices (i.e., MathML support) will create interesting dynamics (i.e., $$$) in the near future
- Meanwhile, the best practices for math ebooks are:
  - Large devices (9”-10”): generate PDF, with suitable page size
  - Small devices (5”-6”): convert to EPUB, using images for maths (LaTeXML, plasTeX, and TeX4ht do a decent job)


Gosh, isn’t he done, *yet*?

Good News!

Available in EPUB and MOBI format (and soon on FreeBoox!)

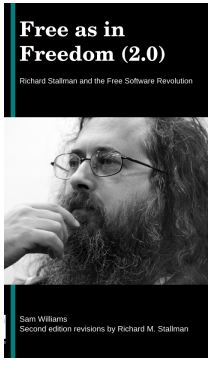


Richard Stallman

Free Software, Free Society

Selected Essays of Richard M. Stallman, Second Edition

`http://www.dei.unipd.it/~pettarin/fsfs2.html`



Sam Williams and Richard Stallman

Free as in Freedom

Richard Stallman and the Free Software Revolution, Second Edition

`http://www.dei.unipd.it/~pettarin/faif2.html`

Alberto Pettarin

pettarin@gmail.com

License and Credits

http://www.mylocalwebdesigner.com/


http://parpg-trac.cvsdude.com/


http://www.idpf.org/


http://www.sodahead.com/


http://lookatmyhappyrainbow.blogspot.com/


http://www.tug.org/texshowcase/


http://en.wikipedia.org/


http://www.quickmeme.com/meme/356w9f/


http://web.math.unifi.it/users/ottavian/


http://alexbramwellphotos.blogspot.com/


http://www.usermode.org/


http://images.paraorkut.com/


http://media.texample.net/tikz/examples/


http://www.hindawi.com/


http://arxiv.org/


http://www.fsf.org


http://www.istockphoto.com/