Annoucning v1.0!

among other things

Ian Mitchell

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Abstract

This is the demo for the other set of fonts I'm using in *Quetzalcoatl*, StixTwo and Noto Sans—they can be mixed and matched to your heart's content, but I thought I would show them both off in one document. I think they're both nice, useful fonts.

Introduction

As you can tell, there's something different about this demo—there are new fonts. Yep, I added in a few new fonts to use, and you can read about them in the next section.

As you might be able to tell, *Quetzalcoatl* is largely influenced by my workflow. The main way I produce documents is just by writing a markdown file, then using a few macros to produce a PDF output using this template, and it's been that way for about three years now, roughly. When I was younger—from about eighth through eleventh grade—I used to write LaTeX files *from scratch* every single time I wanted to write a document. Naturally, this wasn't really conducive to getting anything done—pandoc, in that regard, basically saved me from wasting so much needless time writing whole TeX files.

I've been working on *this* particular template since 2022-01-13, but in reality I've been working on a pandoc template for about two years now—before then I was just using the Eisvogel° template—but *Quetzalcoatl* represents a much better, much more thought out pandoc template. Originally, I used a copy of the default pandoc + XeTeX template with a few things swapped—*Quetzalcoatl*, though, was done pretty much from scratch. I'm quite proud of that.

Today (2023-03-04) I'm *finally* releasing this as version 1.0 of *Quetzalcoatl*. That might not seem like a big achievement—it's not like

it's a potentially important piece of software—but it is to me. I've never actually felt comfortable doing an actual *version* of anything I've worked on.

New fonts[1]

Look at me—I decided to switch it up a bit for this. Yeah, I included a new stylistic set into the template. Now, instead of just XCharter and Inter, there's StixTwo and Noto Sans—the latter pair quite well with each other.

Beaten with Stix

I know what you're probably thinking: Why would I put *Stix* into my beautiful, precious pandoc template?—how could I *ever* put something even remotely resembling *Times* into the *greatest* piece of typesetting ever made? Well, here's the thing—I actually really like Stix. Aesthetically, I prefer Charter, just because it's *different*—and readable on many displays—but it's not the only typeface I really like.

Stix is a wonderful workhorse typeface, and has many modern features sorely missing from XCharter, like ligatures, case alternatives, and, what should be standard in basically every serious, non-decorative typeface, kerning. Stix also has a very nice *italic* and **bold**, and to boot has a wonderful math font to go with it. In general, Stix really has the whole package.

Noto Sans

Noto Sans is a pretty nifty sans serif with *loads* of symbols, and some nice features, such as a proper *italic*. I can type "fuck" in italics and it'll have a long f. Watch—*fuck*!

Math typesetting

Physics stuff

Header 3.

Here's some math typesetting stuff. For starters I'll just write down the Linblad equation, a nice bit of physics for open quantum systems,

$$\begin{aligned}\frac{\partial \rho(r,t)}{\partial t} &= \sum_j \gamma_j \left(\hat{L}_j \rho(r,t) \hat{L}_j^\dagger - \frac{1}{2} \left\{ \hat{L}_j \hat{L}_j^\dagger, \rho(r,t) \right\} \right) \\ &\quad - i[H, \rho(r,t)] \,.\end{aligned} \tag{1}$$

[1] Yes, I'm saying "font" instead of "typeface" now. For a while I had a weird superiority complex over calling fonts "typefaces", because "fonts are just variations in a typeface", but time—and Microsoft Office—have changed the meaning of the word. Rather than attempt to cling on to the old, I will simply embrace the change. Saying "font" instead of "typeface" also has some practical benefit—it certainly cuts down on character length.

Super deep questions

Does $v = v$? How do g, u, v and v, w, and z look? This is slightly unrelated to the Linblad equation, since it's classical, but I'm the God of this document, so I'll also write down the Boltzmann equation,

$$\frac{\mathrm{d}f}{\mathrm{d}t} + \frac{\partial H}{\partial \mathbf{p}} \cdot \nabla f + \frac{\partial H}{\partial \mathbf{r}} \cdot \frac{\partial f}{\partial \mathbf{p}} = \left(\frac{\partial f}{\partial t}\right)_{\text{coll}} . \tag{2}$$

Another header 3.

What about some *even more* fun stuff with Green's functions?—possibly from *Quantum Kinetics in Transport and Optics of Semiconductors* by Haug and Jauho?

$$G(x,t;x',t') = \theta(t-t')G^{>}(x,t;x',t') + \theta(t'-t)G^{<}(x,t;x',t') .$$

$$A(k,\omega) = \mathrm{i}[G^{>}(k,\omega) - G^{<}(k,\omega)]$$

Maybe there's an equation we can use from Freerick's *Transport in Multilayer Nanostructures*?

$$G_{ii}(z) = \int \frac{A_{ii}(\omega')}{z-\omega'}\,\mathrm{d}\omega' .$$

$$\begin{aligned}\frac{\partial G_{ij}(\tau)}{\partial \tau} &= \theta(\tau)\left\langle \hat{c}_j^{\dagger}(0)\left[\hat{\mathscr{H}} - \mu N, \hat{c}_i(\tau)\right]\right\rangle \\ &\quad - \theta(\tau)\left\langle \left[\hat{\mathscr{H}} - \mu N, \hat{c}_i(\tau)\right]\hat{c}_j^{\dagger}(0)\right\rangle .\end{aligned} \tag{3}$$

The *LaTeX Companion* gauntlet

A problematic example:

$$t[u_1,\dots,u_n] = \sum_{k=1}^{n} \binom{n-1}{k-1} (1-t)^{n-k} t^{k-1} u_k$$

An example showing a trigonometric function:

$$\sin\frac{\alpha}{2} = \pm\sqrt{\frac{1-\cos\alpha}{2}}$$

Let f be analytic in the region G except for the isolated singularities $a_1, a_2, \dots, a_m$. If γ is a closed rectifiable curve in G which does not pass through any of the points a_k and if $\gamma \approx 0$ in G, then

$$\frac{1}{2\pi i}\int_{\gamma} f\left(x^{\mathbf{N}\in\mathbb{C}^{N\times 10}}\right) = \sum_{k=1}^{m} n(\gamma;a_k) \oint (f;a_k) .$$

First some large operators both in text: $\iiint_Q f(x,y,z)\,\mathrm{d}x\,\mathrm{d}y\,\mathrm{d}z$ and $\prod_{\gamma\in\Gamma_{\tilde{C}}}\partial(\tilde{X}_\gamma)$; and also on display

$$\iiiint_Q f(w,x,y,z)\,\mathrm{d}w\,\mathrm{d}x\,\mathrm{d}y\,\mathrm{d}z \leq \oint_{\partial Q} f'\left(\max\left\{\frac{\|w\|}{|w^2+x^2|};\frac{\|z\|}{|y^2+z^2|};\frac{\|w\oplus z\|}{|x\oplus y|}\right\}\right).$$