

## Astrological charts with horoscop and starfont

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### Abstract

$\text{\TeX}$  should create beautiful documents for all fields of human endeavour, and in this talk, I describe one frequently under-served by typesetting systems: astrology. Astrology has its own tradition of written knowledge and symbolic notation, analogous to that of mathematics but arguably even older; and like mathematics, astrology presents unique challenges for typesetting. Writers of astrological software often focus their attention primarily on the calculations, leaving any kind of graphical presentation as an afterthought. In this talk I present the `horoscop` and `starfont`  $\text{\LaTeX}$  packages, meant for creating visually appealing astrological documents using  $\text{\TeX}$ . No prior knowledge of astrology, and not too much of  $\text{\TeX}$ , will be assumed.

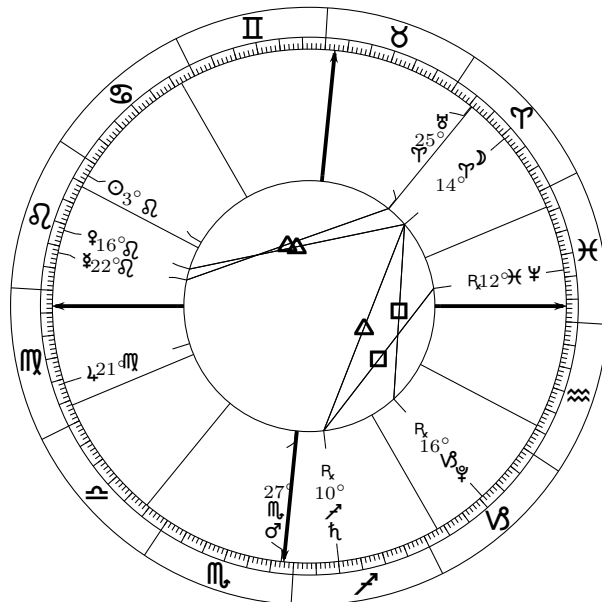
### starfont and horoscop

Human beings have looked for meaning in the sky since early prehistoric times. Some of our oldest written materials record the phases of the moon, and seasonal variations in the rising and setting of the sun. Astrological goals such as eclipse prediction motivated much of early mathematics; and mathematical developments in turn made possible more complicated astrological investigations. As mathematics developed a written symbolic notation, so did astrology. It is only recently that the two disciplines were considered distinct from each other at all.

So if  $\text{\TeX}$  is the best tool for typesetting mathematics, then shouldn't it also be useful for typesetting astrology? The question is especially important because there are very few other good tools available. Historically, authors of astrological documents would draw their charts by hand, or use hand-set type. The availability of computers has made astrological computations much easier and more precise; but graphical output from astrological software is often disappointing.

I wrote the  $\text{\LaTeX}$  packages called `starfont` and `horoscop`, starting around 2003, to bring high-quality astrological typesetting to the  $\text{\TeX}$  world. Both are available from CTAN.

The `starfont` package provides the two fonts named StarFont Sans and StarFont Serif, designed by Anthony I.P. Owen. These fonts include signs of the zodiac like  $\Upsilon$   $\Upsilon$   $\text{\textcircled{M}}$  and planet glyphs like  $\text{\textcircled{V}}$   $\text{\textcircled{F}}$   $\text{\textcircled{O}}$ , as well as other astrological and alchemical symbols. Other  $\text{\LaTeX}$  packages offer some of these characters,



**Figure 1:** Mundane horoscope for the opening of TUG 2016: 8:45AM, July 25, 2016, Toronto.

but often in ways unsuitable for high-quality astrological typesetting. For example, `wasysym`'s Leo  $\Omega$  and North Node  $\text{\textcircled{N}}$  are indistinguishable.

The `horoscop` package's main function is generating wheel charts as in Figure 1. This kind of chart represents the sky at a specific time and place in a schematic form that emphasizes the information most relevant to astrological interpretation. The package can take manually-specified coordinates for celestial bodies or interface to external software via `\write18` to calculate their positions.

There are some challenges behind the scenes in typesetting such a chart. Most of the plotting is done in polar coordinates, requiring trigonometric calculations in  $\text{\TeX}$  code. Labels plotted on the chart should not collide even if the objects they represent are near each other in the sky, so the package recalculates positions iteratively, using spring tension. A less visible challenge concerns rounding coordinates to lower precision, because the details of the rounding rules are significant in interpretation.

The `horoscop` package provides a range of ready-made chart designs, and also a framework for users to define their own. It aims to bring  $\text{\TeX}$ 's astrology to the same level as  $\text{\TeX}$ 's mathematics.

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