

Modern Beamer Presentations with the **metropolis** package

Matthias Vogelgesang

matthias.vogelgesang@gmail.com

v1.1 — 2016/03/14

Contents

1	Introduction	3
2	Getting Started	4
2.1	Installing from CTAN	4
2.2	Installing from GitHub	4
2.3	A Minimal Example	5
2.4	Dependencies	6
2.5	Pandoc	6
3	Customization	6
3.1	Package options	6
3.1.1	Main theme	7
3.1.2	Inner theme	7
3.1.3	Outer theme	8
3.1.4	Color theme	8
3.1.5	Font theme	8
3.2	Color Customization	8
3.3	Font Customization	9
3.3.1	Old style figures	9
3.4	Commands	10
3.4.1	Standout frames	10

4	pgfplots integration	10
4.1	Styles	10
4.2	Paul Tol colors	11
5	Tips & Tricks	11
5.1	Backup Slides	11
6	Known Issues	11
6.1	Title formats	11
6.2	Interactions with other color themes	12
6.3	Notes on second screen	13
6.4	Standout frames with labels	13
6.5	Standout frames with Pandoc	14
7	License	14
8	Implementation	14
8.1	metropolis parent theme	14
8.1.1	Package dependencies	15
8.1.2	Options	15
8.1.3	Component sub-packages	17
8.1.4	Custom commands	17
8.1.5	Process package options	18
8.2	metropolis inner theme	18
8.2.1	Package dependencies	18
8.2.2	Options	18
8.2.3	Title page	19
8.2.4	Section page	22
8.2.5	Block environments	24
8.2.6	Lists and floats	26
8.2.7	Footnotes	27
8.2.8	Text and spacing settings	27
8.2.9	Standout frames	27
8.2.10	Process package options	28
8.3	metropolis outer theme	29
8.3.1	Package dependencies	29
8.3.2	Options	29
8.3.3	Head and footline	30

8.3.4	Frametitle	31
8.3.5	Process package options	32
8.4	metropolis font theme	33
8.4.1	Package dependencies	33
8.4.2	Load Fira fonts	33
8.4.3	General font definitions	35
8.4.4	Title format options	36
8.4.5	Process package options	41
8.5	metropolis color theme	41
8.5.1	Package dependencies	41
8.5.2	Options	41
8.5.3	Base colors	42
8.5.4	Base styles	42
8.5.5	Derived colors	43
8.5.6	Process package options	45
8.6	Tol pgfplots theme	45

1 Introduction

Beamer is an awesome way to make presentations with LaTeX, but its theme selection is surprisingly sparse. The stock themes share an aesthetic that can be a little cluttered, while the few distinctive custom themes available are often specialized for a particular corporate or institutional brand.

The goal of **metropolis** is to provide a simple, modern Beamer theme suitable for anyone to use. It tries to minimize noise and maximize space for content; the only visual flourish it offers is an (optional) progress bar added to each slide or to the section slides.

By default, **metropolis** uses **Fira Sans**, a gorgeous typeface commissioned by Mozilla and designed by **Carrois**. For best results, you will need the Fira typeface installed and use Xe_{La}TeX to typeset your slides. However, **metropolis** can also be used with other typefaces and L^AT_EX build systems.

metropolis's codebase is maintained on **GitHub**. If you have issues, find mistakes in the manual or want to help make the theme even better, please get in touch there. The **full list of contributors** already contains over a dozen names!

2 Getting Started

2.1 Installing from CTAN

For most users, we recommend installing **metropolis** from [CTAN](#). If you keep your \TeX distribution up-to-date, chances are good that **metropolis** is already installed. If it is not, you need to update your packages. If your distribution is \TeX Live (or Mac \TeX on OS X), the following command updates all packages.

```
tlmgr update --all
```

If this results in an error, you may need to run it with administrative privileges:

```
sudo tlmgr update --all
```

Mac \TeX on OS X also provides a graphical interface for **tlmgr** called \TeX Live Utility.

For any other distribution please refer to its documentation on how to update your packages.

To get the most out of the theme you should also install the **Fira** fonts. However, this is not mandatory; **metropolis** also works with the standard fonts.

2.2 Installing from GitHub

If you want to use the cutting-edge development version of **metropolis**, you can install it manually. Like any \LaTeX package, this involves four easy steps:

Download the source with a `git clone` of the [metropolis repository](#) or as a [zip archive](#) of the latest development version.

Compile the style files by running `make sty` inside the downloaded directory. (Or run \LaTeX directly on `source/metropolistheme.ins`.)

Move the resulting *.sty files to the folder containing your presentation. To use **metropolis** with many presentations, run `make install` or move the `*.sty` files to a folder in your \TeX path instead.

Use the theme for your presentation by declaring `\usetheme{metropolis}` in the preamble of your Beamer document.

metropolis uses the Make build system to offer the following installation options for advanced users:

`make sty` builds the theme style files.

`make doc` builds this documentation manual.

`make demo` builds a demo presentation to test the features of **metropolis**.

`make all` builds the theme and manual.

`make clean` removes the files generated by `make all`.

`make install` installs the theme into your local texmf folder.

`make uninstall` removes the theme from your local texmf folder.

2.3 A Minimal Example

The following code shows a minimal example of a Beamer presentation using **metropolis**.

```
\documentclass{beamer}
\usetheme{metropolis}      % Use metropolis theme
\title{A minimal example}
\date{\today}
\author{Matthias Vogelgesang}
\institute{Centre for Modern Beamer Themes}
\begin{document}
  \maketitle
  \section{First Section}
  \begin{frame}{First Frame}
    Hello, world!
  \end{frame}
\end{document}
```

2.4 Dependencies

metropolis depends on the **beamer** class and the following standard packages:

- `tikz`
- `etoolbox`
- `ifxetex`
- `pgfopts`
- `calc`
- `ifluatex`

For best results, we recommend installing the fonts **Fira Sans** and **Fira Mono** and compiling with **metropolis** using \LaTeX or \LuaTeX . These are optional dependencies; **metropolis** is compatible with (e.g.) \pdfLaTeX and will fall back to standard fonts if **Fira Sans** or **Fira Mono** is not installed.

The packaged name of **Fira Sans** is **Fira Sans OT** in some Linux distributions; this case is automatically handled by **metropolis**.

2.5 Pandoc

To use this theme with **Pandoc**-based presentations, you can run the following command

```
$ pandoc -t beamer --latex-engine=xelatex -V theme:  
    metropolis -o output.pdf input.md
```

3 Customization

3.1 Package options

The theme provides a number of options, which can be set using a key=value interface. The primary way to set options is to provide a comma-separated list of option-value pairs when loading **metropolis** in the preamble:

```
\usetheme[option1=value1, option2=value2, ...]{metropolis}
```

Options can be changed at any time — even mid-presentation! — with the `\metroset` macro.

```
\metroset{option1=newvalue1, option2=newvalue2, ...}
```

The list of options is structured as shown in the following example.

option key *list of possible values* default
 A short description of the option.

3.1.1 Main theme

titleformat *regular, smallcaps, allsmallcaps, allcaps* regular
 Changes the format of titles, subtitles, section titles, frame titles, and the text on “standout” frames. The available options produce Regular, SMALLCAPS, ALLSMALLCAPS, or ALLCAPS titles. Please refer to Section 6.1 for known issues with these options.

titleformat plain *regular, smallcaps, allsmallcaps, allcaps* regular
 Changes the format of “standout” frames (see titleformat, above).

3.1.2 Inner theme

sectionpage *none, simple, progressbar* progressbar
 Adds a slide at the start of each section (**simple**) with an optional thin progress bar below the section title (**progressbar**). The **none** option disables the section page.

subsectionpage *none, simple, progressbar* none
 Optionally adds a slide at the start of each subsection. If enabled with the **simple** or **progressbar** options, the style of the **section page** will be updated to match the style of the **subsection page**. Note that section slides and subsection slides can appear consecutively if both are enabled; you may want to use this option together with **sectionpage=none** depending on the section structure of your presentation.

3.1.3 Outer theme

numbering	<i>none, counter, fraction</i>	counter
	Controls whether the frame number at the bottom right of each slide is omitted (none), shown (counter) or displayed as a fraction of the total number of frames (fraction).	
progressbar	<i>none, head, frametitle, foot</i>	none
	Optionally adds a progress bar to the top of each frame (head), the bottom of each frame (foot), or directly below each frame title (frametitle).	

3.1.4 Color theme

block	<i>transparent, fill</i>	transparent
	Optionally adds a light grey background to block environments like theorem and example .	
background	<i>dark, light</i>	light
	Provides the option to have a dark background and light foreground instead of the reverse.	

3.1.5 Font theme

titleformat title	<i>regular, smallcaps, allsmallcaps, allcaps</i>	regular
titleformat subtitle	Individually controls the format of titles, subtitles, section titles, and frame titles (see titleformat , above).	
titeformat section		
titleformat frame		

3.2 Color Customization

The included **metropolis** color theme is used by default, but its colors can be easily changed to suit your tastes. All of the theme's styles are defined in terms of three beamer colors:

- **normal text** (dark fg, light bg)
- **alerted text** (colored fg, should be visible against dark or light)

- `example text` (colored fg, should be visible against dark or light)

An easy way to customize the theme is to redefine these colors using

```
\setbeamercolor{ ... }{ fg= ... , bg= ... }
```

in your preamble. For greater customization, you can redefine any of the other stock beamer colors. In addition to the stock colors the theme defines a number of **metropolis** specific colors, which can also be redefined to your liking.

```
\setbeamercolor{progress bar}{ ... }
\setbeamercolor{title separator}{ ... }
\setbeamercolor{progress bar in head/foot}{ ... }
\setbeamercolor{progress bar in section page}{ ... }
```

3.3 Font Customization

The default font for **metropolis** is Fira. This can be easily changed using the standard font selection commands of the `fontspec` package. So if you prefer, for example, the **Ubuntu** font family, just add the following two commands after loading the **metropolis** theme.

```
\setsansfont{Ubuntu}
\setmonofont{Ubuntu Mono}
```

If you are expecting to present in a large room or with an underpowered projector, you may want to change the font to a heavier weight of Fira to maximize readability.

```
\setsansfont[BoldFont={Fira Sans SemiBold}]{Fira Sans Book}
```

3.3.1 Old style figures

The regular `fontspec` mechanism for changing glyph appearance applies also to this theme. If you want to have old style figures in the text but regular lined figures for math, you could add the following to your preamble:

```

\usefonttheme{professionalfonts}    % required for mathspec
\usepackage{mathspec}
\setsansfont[BoldFont={Fira Sans},
             Numbers={OldStyle}]{Fira Sans Light}
\setmathsfon(Digits)[Numbers={Lining, Proportional}]{Fira
             Sans Light}

```

3.4 Commands

3.4.1 Standout frames

The **metropolis** inner theme offers a custom frame format with large, centered text and an inverted background — perfect for focusing attention on single sentence or image. To use it, add the key **standout** to the frame:

```

\begin{frame}[standout]
    Thank you!
\end{frame}

```

4 pgfplots integration

metropolis comes with a set of pre-defined pgfplots styles and a color theme based on Paul Tol's color scheme.

4.1 Styles

Pass the following style keys to the axis environment to get the appropriate effect:

mlineplot Plot regular line charts with reduced axis frames, less intrusive legend and subdued grid.

mbarplot Plot vertical bar charts in a similar way as **mlineplot** but reduce grid usage.

horizontal mbarplot Plot horizontal bar charts.

`disable thousands separator` Helper style to remove thousands separator.

4.2 Paul Tol colors

A good presentation uses colors that are distinct from each other as much as possible as well as from black and white, can be discerned item under different lighting and display environments and by color-blind viewers, while matching well together.

In a [technical note](#) for SRON, Paul Tol proposed a palette of colors satisfying these constraints. The sub-package `pgfplots-themetol` defines palettes for `pgfplots` charts based on Tol's work.

5 Tips & Tricks

5.1 Backup Slides

Speakers will often include extra slides at the end of their presentation to refer to during audience questions. One easy way to do this is to include the `appendixnumberbeamer` package in your preamble and call `\appendix` before your backup slides.

metropolis will automatically turn off slide numbering and progress bars for slides in the appendix.

6 Known Issues

6.1 Title formats

Be aware that not every font supports small caps, so the `smallcaps` or `allsmallcaps` options may not work if you use a font other than **Fira Sans**. In particular, the Computer Modern sans-serif typeface, which is used when **metropolis** is compiled with pdfL^AT_EX, does not have a small-caps variant.

The title format options `allsmallcaps` and `allcaps` are quite nice from an aesthetic point of view, but their use of `\MakeLowercase` and `\MakeUppercase` can

cause unexpected problems. For example:

- Some commands, like `\`, do not work inside `\MakeLowercase` and `\MakeUppercase`. (See [#125](#))
- Only alphabetic characters are affected by `\MakeLowercase`, so numerals and punctuation remain at full height. This can spoil some of the aesthetic benefits of `allsmallcaps`. (See [#33](#))
- `\MakeLowercase` and `\MakeUppercase` apply to math mode and `\scshape` does not. This can easily introduce mathematical errors that are hard to catch.
- It is impossible to typeset symbols which are encoded as uppercase letters in a different font. In particular, `\mathbb` and `\mathcal` letters will be replaced by other math glyphs. (See [#153](#))

The `allsmallcaps` and `allcaps` options are safe to use if your titles contain only alphabetic characters and do not require the expansion of any macros.

6.2 Interactions with other color themes

metropolis can be used along with any other Beamer color theme, such as **crane** or **seahorse**. If you wish to do this, it is usually best to include the **metropolis** subpackages individually so the **metropolis** color theme is never loaded. This will prevent conflicts between the **metropolis** color theme and your preferred theme.

For example, overriding the color theme as follows may not work as expected because `\usetheme{metropolis}` loads the **metropolis** color theme, which defines a relationship between the frametitle background and the primary palette of the theme. Since **seahorse** assumes a different relationship between its palettes, the result is a grey, rather than periwinkle, frametitle background.

```
\usetheme{metropolis}
\usecolortheme{seahorse}
```

The correct colors are chosen if the **metropolis** outer, inner, and font themes are loaded separately:

```
\useoutertheme{metropolis}
\useinnertheme{metropolis}
\usefonttheme{metropolis}
```

```
\usecolortheme{seahorse}    % or your preferred color theme
```

Please note that **metropolis** may not use all the colors defined in your favourite Beamer color theme. In particular, **metropolis** does not set a background color for the title; this will cause issues when using color themes like **whale** which set a white foreground for the title.

6.3 Notes on second screen

If you use the `[show notes on second screen]` option built in to Beamer and compile with $\text{Xe}^{\text{L}}\text{A}^{\text{T}}\text{E}^{\text{X}}$, text on slides following the first section slide may be rendered in white instead of the regular colour. This is due to a **bug** in Beamer or $\text{Xe}^{\text{L}}\text{A}^{\text{T}}\text{E}^{\text{X}}$ itself. You can work around it either by compiling with $\text{Lua}^{\text{T}}\text{E}^{\text{X}}$ or by adding the following code to your preamble to reset the text color on each slide.

```
\makeatletter
\def\beamer@frametitlebegin{% at beginning of slide
    \usebeamercolor[fg]{normal text}
    \gdef\beamer@noteitems{}%
    \gdef\beamer@notes{}%
}
\makeatother
```

6.4 Standout frames with labels

Because the **standout** frame option creates a group to restrict the colour change to a single slide, labels defined after calling **standout** will stay local to the group. In other words, the following may result in a “label undefined” error.

```
\begin{frame}[standout, label=conclusion]{Conclusion}
    Awesome slide
\end{frame}
```

To fix this problem, change the order of the keys in the frame.

```
\begin{frame}[label=conclusion, standout]{Conclusion}
```

```
Awesome slide
\end{frame}
```

This error can be unwittingly triggered if you export your slides from Emacs Org mode, which automatically adds labels after frame options. Alex Branham [offers](#) the following solution for Org mode users, using `org-set-property`.

```
* Start of a frame
:PROPERTIES:
:BEAMER_opt: label=conclusion,standout
:END:
```

6.5 Standout frames with Pandoc

With Pandoc versions prior 1.17.2 it was not possible to create standout frames because Pandoc only supported a specific list of frame attributes thus ignoring additional attributes such as `{.standout}`.

7 License

metropolis is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](#). This means that if you change the theme and re-distribute it, you must retain the copyright notice header and license it under the same CC-BY-SA license. This does not affect any presentations that you create with the theme.

8 Implementation

8.1 metropolis parent theme

The primary job of this package is to load the component sub-packages of the **metropolis** theme and route the theme options accordingly. It also provides some custom commands and environments for the user.

8.1.1 Package dependencies

```
1 \RequirePackage{etoolbox}
2 \RequirePackage{pgfopts}
```

8.1.2 Options

Most options are passed off to the component sub-packages.

```
3 \pgfkeys{/metropolis/.cd,
4   .search also={
5     /metropolis/inner,
6     /metropolis/outer,
7     /metropolis/color,
8     /metropolis/font,
9   }
10 }
```

`titleformat plain` Controls the formatting of the text on standout “plain” frames.

```
11 \pgfkeys{
12   /metropolis/titleformat plain/.cd,
13   .is choice,
14   regular/.code={%
15     \let\metropolis@plaintitleformat\@empty%
16     \setbeamerfont{standout}{shape=\normalfont}%
17   },
18   smallcaps/.code={%
19     \let\metropolis@plaintitleformat\@empty%
20     \setbeamerfont{standout}{shape=\scshape}%
21   },
22   allsmallcaps/.code={%
23     \let\metropolis@plaintitleformat\MakeLowercase%
24     \setbeamerfont{standout}{shape=\scshape}%
25     \PackageWarning{beamerthememetropolis}{%
26       Be aware that titleformat plain=allsmallcaps can lead to problems%
27     }
28   },
29   allcaps/.code={%
30     \let\metropolis@plaintitleformat\MakeUppercase%
31     \setbeamerfont{standout}{shape=\normalfont}%

```

```

32     \PackageWarning{beamerthememetropolis}{%
33         Be aware that titleformat plain=allcaps can lead to problems%
34     }
35 },
36 }

```

titleformat Sets a standard format for titles, subtitles, section titles, frame titles, and the text on standout “plain” frames.

```

37 \pgfkeys{
38   /metropolis/titleformat/.code=\pgfkeysalso{
39     font/titleformat title=#1,
40     font/titleformat subtitle=#1,
41     font/titleformat section=#1,
42     font/titleformat frame=#1,
43     titleformat plain=#1,
44   }
45 }

```

For backwards compatibility with earlier betas of the theme, we implement deprecated option names as aliases to the corresponding **key=value** options.

```

46 \pgfkeys{/metropolis/.cd,
47   usetitleprogressbar/.code=\pgfkeysalso{outer/progressbar=frametitle},
48   noslidenumbers/.code=\pgfkeysalso{outer/numbering=none},
49   usetotalslideindicator/.code=\pgfkeysalso{outer/numbering=fraction},
50   nosectionslide/.code=\pgfkeysalso{inner/sectionpage=none},
51   darkcolors/.code=\pgfkeysalso{color/background=dark},
52   blockbg/.code=\pgfkeysalso{color/block=fill, inner/block=fill},
53 }

```

Set default values for options.

```

54 \newcommand{\metropolis@setdefaults}{
55   \pgfkeys{/metropolis/.cd,
56     titleformat plain=regular,
57   }
58 }

```


8.1.3 Component sub-packages

Having processed the options, we can now load the component sub-packages of the theme.

```
59 \useinnertheme{metropolis}
60 \useoutertheme{metropolis}
61 \usecolortheme{metropolis}
62 \usefonttheme{metropolis}
```

The `tol` theme for `pgfplots` is only loaded if `pgfplots` is used.

```
63 \AtEndPreamble{%
64   \ifpackageloaded{pgfplots}{%
65     \RequirePackage{pgfplotsthemetol}
66   }{}
67 }
```

8.1.4 Custom commands

The parent theme defines custom commands as their proper usage may depend on multiple sub-packages.

`\metroset` Allows the user to change options midway through a presentation.

```
68 \newcommand{\metroset}[1]{\pgfkeys{/metropolis/.cd,#1}}
```

`\plain` Creates a plain frame with dark background, suitable for displaying images or a few words. The format of the text can be set with the `titleformat plain` option.

```
69 \def\metropolis@plaintitleformat#1{#1}
70 \newcommand{\plain}[2][]{%
71   \PackageWarning{beamerthememetropolis}{%
72     The syntax '\plain' may be deprecated in a future version of Metropolis.
73     Please use a frame with [standout] instead.
74   }
75   \begin{frame}[standout]{#1}
76     \metropolis@plaintitleformat{#2}
77   \end{frame}
78 }
```

`\mreducelistspacing`

```
79 \newcommand{\mreducelistspacing}{\vspace{-\topsep}}
```

8.1.5 Process package options

```
80 \metropolis@setdefaults
81 \ProcessPgfOptions{/metropolis}
```

8.2 metropolis inner theme

A beamer inner theme dictates the style of the frame elements traditionally set in the “body” of each slide. These include:

- title, part, and section pages;
- itemize, enumerate, and description environments;
- block environments including theorems and proofs;
- figures and tables; and
- footnotes and plain text.

8.2.1 Package dependencies

```
82 \RequirePackage{etoolbox}
83 \RequirePackage{keyval}
84 \RequirePackage{calc}
85 \RequirePackage{pgfopts}
86 \RequirePackage{tikz}
```

8.2.2 Options

`sectionpage` Optionally add a slide marking the beginning of each section.

```
87 \pgfkeys{
88   /metropolis/inner/sectionpage/.cd,
89   .is choice,
90   none/.code=\metropolis@disablesectionpage,
91   simple/.code={\metropolis@enablesectionpage
92                 \setbeamertemplate{section page}[simple]},
93   progressbar/.code={\metropolis@enablesectionpage
94                      \setbeamertemplate{section page}[progressbar]},
95 }
```

subsectionpage Optionally add a slide marking the beginning of each subsection.

```
96 \pgfkeys{
97   /metropolis/inner/subsectionpage/.cd,
98   .is choice,
99   none/.code=\metropolis@disablesubsectionpage,
100   simple/.code={\metropolis@enablesubsectionpage
101                 \setbeamertemplate{section page}[simple]},
102   progressbar/.code={\metropolis@enablesubsectionpage
103                      \setbeamertemplate{section page}[progressbar]},
104 }
```

\metropolis@inner@setdefaults Set default values for inner theme options.

```
105 \newcommand{\metropolis@inner@setdefaults}{
106   \pgfkeys{/metropolis/inner/.cd,
107     sectionpage=progressbar,
108     subsectionpage=none
109   }
110 }
```

8.2.3 Title page

title page Template for the title page. Each element is only typset if it is defined by the user. If `\subtitle` is empty, for example, it won't leave a blank space on the title slide.

```
111 \setbeamertemplate{title page}{
112   \begin{minipage}[b][\paperheight]{\textwidth}
113     \ifx\inserttitlegraphic\@empty\else\usebeamertemplate*{title graphic}\fi
114     \vfill%
115     \ifx\inserttitle\@empty\else\usebeamertemplate*{title}\fi
116     \ifx\insertsubtitle\@empty\else\usebeamertemplate*{subtitle}\fi
117     \usebeamertemplate*{title separator}
118   \end{minipage}
119 }
```

Beamer's definition of `\insertauthor` is always nonempty, so we have to test another macro initialized by `\author{...}` to see if the user has defined an author. This solution was suggested by Enrico Gregorio in an answer to [this Stack Exchange question](#).

```
118   \ifx\beamer@shortauthor\@empty\else\usebeamertemplate*{author}\fi
119 }
```

```

119 \ifx\insertdate\@empty\else\usebeamertemplate*{date}\fi
120 \ifx\insertinstitute\@empty\else\usebeamertemplate*{institute}\fi
121 \vfill
122 \vspace*{1mm}
123 \end{minipage}
124 }

```

Normal people should use `\maketitle` or `\titlepage` instead of using the `title page` beamer template directly. Beamer already defines these macros, but we patch them here to make the title page `[plain]` by default, remove `\@thanks`, and ensure the title frame number doesn't count.

`\maketitle` Inserts the title frame, or causes the current frame to use the `title page` template.

```

\titlepage
125 \def\maketitle{%
126 \ifbeamer@inframe
127 \titlepage
128 \else
129 \frame[plain,noframenumbering]{\titlepage}
130 \fi
131 }
132 \def\titlepage{%
133 \usebeamertemplate{title page}
134 }

```

`title graphic` Set the title graphic in a zero-height box, so it doesn't change the position of other elements.

```

135 \setbeamertemplate{title graphic}{
136 \vbox to 0pt {
137 \vspace*{2em}
138 \inserttitlegraphic%
139 }%
140 \nointerlineskip%
141 }

```

`title` Set the title on the title page.

```

142 \setbeamertemplate{title}{
143 \raggedright%
144 \linespread{1.0}%

```

```

145 \inserttitle%
146 \par%
147 \vspace*{0.5em}
148 }

```

subtitle Set the subtitle on the title page.

```

149 \setbeamertemplate{subtitle}{
150   \raggedright%
151   \insertsubtitle%
152   \par%
153   \vspace*{0.5em}
154 }

```

title separator Template to set the title graphic in a zero-height box. (It won't change the position of other elements.)

```

155 \setbeamertemplate{title separator}{
156   \begin{tikzpicture}
157     \fill[fg] (0,0) rectangle (\textwidth, 0.4pt);
158   \end{tikzpicture}%
159   \par%
160 }

```

author Set the author on the title page.

```

161 \setbeamertemplate{author}{
162   \vspace*{2em}
163   \insertauthor%
164   \par%
165   \vspace*{0.25em}
166 }

```

date Set the date on the title page.

```

167 \setbeamertemplate{date}{
168   \insertdate%
169   \par%
170 }

```

institute Set the institute on the title page.

```

171 \setbeamertemplate{institute}{
172   \vspace*{3mm}
173   \insertinstitute%
174   \par%
175 }

```

8.2.4 Section page

`section page` Template for the section title slide at the beginning of each section.

```

176 \defbeamertemplate{section page}{simple}{
177   \begin{center}
178     \usebeamercolor[fg]{section title}
179     \usebeamerfont{section title}
180     \insertsectionhead\par
181     \ifx\insertsubsectionhead\@empty\else
182       \usebeamercolor[fg]{subsection title}
183       \usebeamerfont{subsection title}
184       \insertsubsectionhead
185     \fi
186   \end{center}
187 }
188 \defbeamertemplate{section page}{progressbar}{
189   \centering
190   \begin{minipage}{22em}
191     \raggedright
192     \usebeamercolor[fg]{section title}
193     \usebeamerfont{section title}
194     \insertsectionhead\[-1ex]
195     \usebeamertemplate*{progress bar in section page}
196     \par
197     \ifx\insertsubsectionhead\@empty\else%
198       \usebeamercolor[fg]{subsection title}%
199       \usebeamerfont{subsection title}%
200       \insertsubsectionhead
201     \fi
202   \end{minipage}
203   \par
204   \vspace{\baselineskip}
205 }

```

```

206 \newcommand{\metropolis@disablesectionpage}{
207   \AtBeginSection{
208     % intentionally empty
209   }
210 }
211 \newcommand{\metropolis@enablesectionpage}{
212   \AtBeginSection{
213     \ifbeamer@inframe
214       \sectionpage
215     \else
216       \frame[plain,c,noframenumbering]{\sectionpage}
217     \fi
218   }
219 }

```

subsection page Template for the subsection title slide that can optionally be added to at the beginning of each subsection.

```

220 \setbeamertemplate{subsection page}{%
221   \usebeamertemplate*{section page}
222 }
223 \newcommand{\metropolis@disablesubsectionpage}{
224   \AtBeginSubsection{
225     % intentionally empty
226   }
227 }
228 \newcommand{\metropolis@enablesubsectionpage}{
229   \AtBeginSubsection{
230     \ifbeamer@inframe
231       \subsectionpage
232     \else
233       \frame[plain,c,noframenumbering]{\subsectionpage}
234     \fi
235   }
236 }

```

progress bar in section page Template for the progress bar displayed by default on the section page. This code is duplicated in large part in the outer theme's template **progress bar in head/foot**.

```

237 \newlength{\metropolis@progressonsectionpage}
238 \setbeamertemplate{progress bar in section page}{

```

```

239 \setlength{\metropolis@progressonsectionpage}{%
240   \textwidth * \ratio{\insertframenumber pt}{\inserttotalframenumber pt}}%
241 }%
242 \begin{tikzpicture}
243   \fill[bg] (0,0) rectangle (\textwidth, 0.4pt);
244   \fill[fg] (0,0) rectangle (\metropolis@progressonsectionpage, 0.4pt);
245 \end{tikzpicture}%
246 }

```

The above code assumes that `\insertframenumber` is less than or equal to `\inserttotalframenumber`. However, this is not true on the first compile; in the absence of an `.aux` file, `\inserttotalframenumber` defaults to 1. This behaviour could cause fatal errors for long presentations, as `\metropolis@progressonsectionpage` would exceed TeX's maximum length (16383.99999pt, roughly 5.75 metres or 18.9 feet). To avoid this, we increase the default value for `\inserttotalframenumber`; presentations with over 4000 slides will still break on first compile, but users in that situation likely have deeper problems to solve.

```

247 \def\inserttotalframenumber{100}

```

8.2.5 Block environments

block The three different block environments differ only in their colours. Rather than
block alerted repeat the essentially the same template three times, we use the auxiliary macro
block example `\metropolis@block` to define all three templates.

```

248 \newlength{\metropolis@blocksep}
249 \newlength{\metropolis@blockadjust}
250 \setlength{\metropolis@blocksep}{0.75ex}
251 \setlength{\metropolis@blockadjust}{0.25ex}
252 \providecommand{\metropolis@strut}{%
253   \vphantom{ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz}}%
254 }
255 \newcommand{\metropolis@block}[1]{
256   \par\vskip\medskipamount%
257   \setlength{\parskip}{0pt}

```

If a background color is defined for the block title or body, we need to add a little bit of padding to the corresponding box. Ideally, this would be accomplished by setting `colsep=0.75ex`, which is intended to add “color separation space”

only when the box has a colored background. Unfortunately, `colsep` also adds this separation if the background color is inherited, even if the inherited color is actually empty. (The technical reason for this boils down to the fact that the `\ifx` directive does not expand macros.)

To achieve the correct spacing for `alertblocks` and `exampleblocks` as well as for normal blocks, we have to begin the `beamercolorbox` differently based on whether `block title` has an empty background.

If the `block title` background is empty, or the user has explicitly removed the background from (e.g.) `block title alerted`, we just need to set a `rightskip` for a nice ragged-right block title.

```

258 \ifbeamercoloreempty[bg]{block title#1}{%
259   \begin{beamercolorbox}[rightskip=0pt plus 4em]{block title#1}}{%
260   \ifbeamercoloreempty[bg]{block title}{%
261     \begin{beamercolorbox}[rightskip=0pt plus 4em]{block title#1}%
262   }%
263 %   \end{macrocode}
264 %
265 %   Otherwise, if the |block title| has a background, we set the padding based
266 %   on |\metropolis@blockskip|. However, we have to visually compensate for
267 %   the |\metropolis@strut| added to the block title (see below) by
268 %   subtracting |\metropolis@blockadjust| from the top and bottom padding.
269 %
270 %   \begin{macrocode}
271 {%
272   \begin{beamercolorbox}[
273     sep=\dimexpr\metropolis@blocksep-\metropolis@blockadjust\relax,
274     leftskip=\metropolis@blockadjust,
275     rightskip=\dimexpr\metropolis@blockadjust plus 4em\relax
276   ]{block title#1}%
277 }%
278 %   \end{macrocode}
279 %
280 %   We can now set the contents of the |block title|. The zero-width but
281 %   positive-height box |\metropolis@strut| ensures that the block title box
282 %   has a consistent height, even if it lacks punctuation, ascenders, or
283 %   descenders.
284 %
285 %   \begin{macrocode}

```

```

286      \usebeamerfont*{block title#1}%
287      \metropolis@strut%
288      \insertblocktitle%
289      \metropolis@strut%
290 \end{beamercolorbox}%
291 % \end{macrocode}
292 %
293 % Next, we typeset the |block body|. This the code is similar to, but simpler
294 % than, the |block title| code since we don't need to adjust for any struts.
295 %
296 % \begin{macrocode}
297 \nointerlineskip%
298 \ifbeamercoloreempty[bg]{block body#1}{%
299   \begin{beamercolorbox}[vmode]{block body#1}{%
300     \ifbeamercoloreempty[bg]{block body}{%
301       \begin{beamercolorbox}[vmode]{block body#1}%
302     }{%
303       \begin{beamercolorbox}[sep=\metropolis@blocksep, vmode]{block body#1}%
304       \vspace{-\metropolis@parskip}
305     }}%
306   \usebeamerfont{block body#1}%
307   \setlength{\parskip}{\metropolis@parskip}%
308 }

```

This concludes the auxiliary macro `\metropolis@block`. Finally, we define the block beamer templates using this macro.

```

309 \setbeamertemplate{block begin}{\metropolis@block{}}
310 \setbeamertemplate{block alerted begin}{\metropolis@block{ alerted}}
311 \setbeamertemplate{block example begin}{\metropolis@block{ example}}
312 \setbeamertemplate{block end}{\end{beamercolorbox}\vspace*{0.2ex}}
313 \setbeamertemplate{block alerted end}{\end{beamercolorbox}\vspace*{0.2ex}}
314 \setbeamertemplate{block example end}{\end{beamercolorbox}\vspace*{0.2ex}}

```

8.2.6 Lists and floats

```

315 \setbeamertemplate{itemize items}{\textbullet}
316 \setbeamertemplate{caption label separator}{: }
317 \setbeamertemplate{caption}[numbered]

```

8.2.7 Footnotes

```
318 \setbeamertemplate{footnote}{%
319   \parindent 0em\noindent%
320   \raggedright
321   \usebeamercolor{footnote}\hbox to 0.8em{\hfil\insertfootnotemark}\insertfootnotetext\par%
322 }
```

8.2.8 Text and spacing settings

```
323 \newlength{\metropolis@parskip}
324 \setlength{\metropolis@parskip}{0.5em}
325 \setlength{\parskip}{\metropolis@parskip}
326 \linespread{1.15}
```

By default, Beamer frames offer the `c` option to *almost* vertically center the text, but the placement is a little too high. To fix this, we redefine the `c` option to equalize `\beamer@frametopskip` and `\beamer@framebottomskip`. This solution was suggested by Enrico Gregorio in an answer to [this Stack Exchange question](#).

```
327 \define@key{beamerframe}{c}[true]{% centered
328   \beamer@frametopskip=0pt plus 1fill\relax%
329   \beamer@framebottomskip=0pt plus 1fill\relax%
330   \beamer@frametopskipautobreak=0pt plus .4\paperheight\relax%
331   \beamer@framebottomskipautobreak=0pt plus .6\paperheight\relax%
332   \def\beamer@initfirstlineunskip{}}%
333 }
```

8.2.9 Standout frames

metropolis offers a custom frame format with large, centered text and an inverted background. To use it, add the key `standout` to the frame: `\begin{frame}[standout] ... \end{frame}`.

standout Optional arguments to Beamer's frames are implemented using `\define@key` from the `keyval` package, which will execute code when the defined option is called. For the `standout` option, we begin a group, change the colors and fonts, and set a alignment.

```
334 \providebool{metropolis@standout}
335 \define@key{beamerframe}{standout}[true]{%
336   \booltrue{metropolis@standout}
337   \begingroup
```

```

338 \setkeys{beamerframe}{c}
339 \setkeys{beamerframe}{noframenumbering}
340 \ifbeamercoloreempty[bg]{palette primary}{
341   \setbeamercolor{background canvas}{
342     use=palette primary,
343     bg=-palette primary.fg
344   }
345 }{
346   \setbeamercolor{background canvas}{
347     use=palette primary,
348     bg=palette primary.bg
349   }
350 }
351 \centering
352 \usebeamercolor[fg]{palette primary}
353 \usebeamerfont{standout}
354 }

```

Then we just have to close the group after the standout slide is finished in order to restore the colours and fonts for the rest of the presentation. Unfortunately, we cannot use `\endgroup` or this (see <http://tex.stackexchange.com/questions/226319/>). Instead, we add the `\endgroup` to `\beamer@reseteecodes`, which is run exactly once at the end of each slide.

```

355 \apptocmd{\beamer@reseteecodes}{%
356   \ifbool{metropolis@standout}{
357     \endgroup
358     \boolfalse{metropolis@standout}
359   }{}
360 }{}{}

```

8.2.10 Process package options

```

361 \metropolis@inner@setdefaults
362 \ProcessPgfPackageOptions{/metropolis/inner}

```

8.3 metropolis outer theme

A beamer outer theme dictates the style of the frame elements traditionally set outside the body of each slide: the head, footline, and frame title.

8.3.1 Package dependencies

```
363 \RequirePackage{etoolbox}
364 \RequirePackage{calc}
365 \RequirePackage{pgfopts}
```

8.3.2 Options

numbering Adds slide numbers to the bottom right of each slide.

```
366 \pgfkeys{
367   /metropolis/outer/numbering/.cd,
368   .is choice,
369   none/.code=\setbeamertemplate{frame numbering}[none],
370   counter/.code=\setbeamertemplate{frame numbering}[counter],
371   fraction/.code=\setbeamertemplate{frame numbering}[fraction],
372 }
```

progressbar Adds a progress bar to the top, bottom, or frametitle of each slide.

```
373 \pgfkeys{
374   /metropolis/outer/progressbar/.cd,
375   .is choice,
376   none/.code={%
377     \setbeamertemplate{headline}[plain]
378     \setbeamertemplate{frametitle}[plain]
379     \setbeamertemplate{footline}[plain]
380   },
381   head/.code={\pgfkeys{/metropolis/outer/progressbar=none}
382     \addtobeamertemplate{headline}{}{%
383       \usebeamertemplate*{progress bar in head/foot}
384     }
385   },
386   frametitle/.code={\pgfkeys{/metropolis/outer/progressbar=none}
387     \addtobeamertemplate{frametitle}{}{%
388       \usebeamertemplate*{progress bar in head/foot}
```

```

389     }
390   },
391   foot/.code={\pgfkeys{/metropolis/outer/progressbar=none}
392     \addtobeamertemplate{footline}{}{%
393       \usebeamertemplate*{progress bar in head/foot}%
394     }
395   },
396 }

```

`\metropolis@outer@setdefaults` Sets default values for outer theme options.

```

397 \newcommand{\metropolis@outer@setdefaults}{
398   \pgfkeys{/metropolis/outer/.cd,
399     numbering=counter,
400     progressbar=none,
401   }
402 }

```

8.3.3 Head and footline

All good **beamer** presentations should already remove the navigation symbols, but **metropolis** removes them automatically (just in case).

```

403 \setbeamertemplate{navigation symbols}{}

```

frame numbering Templates for the frame number. Can be omitted, shown or displayed as a fraction of the total frames.

```

404 \defbeamertemplate{frame footer}{none}{}
405 \defbeamertemplate{frame footer}{custom}[1]{ #1 }

406 \defbeamertemplate{frame numbering}{none}{}
407 \defbeamertemplate{frame numbering}{counter}{\insertframenumbers}
408 \defbeamertemplate{frame numbering}{fraction}{
409   \insertframenumbers/\inserttotalframenumbers
410 }

```

headline Templates for the head- and footline at the top and bottom of each frame.

footline

```

411 \defbeamertemplate{headline}{plain}{}
412 \defbeamertemplate{footline}{plain}{}

```

```

413 \begin{beamercolorbox}[wd=\textwidth, sep=3ex]{footline}%
414   \usebeamerfont{page number in head/foot}%
415   \usebeamertemplate*{frame footer}
416   \hfill%
417   \usebeamertemplate*{frame numbering}
418 \end{beamercolorbox}%
419 }

```

8.3.4 Frametitle

frametitle Templates for the frame title, which is optionally underlined with a progress bar.

```

420 \newlength{\metropolis@frametitle@padding}
421 \setlength{\metropolis@frametitle@padding}{2.2ex}
422 \newcommand{\metropolis@frametitlestrut@start}{
423   \rule{0pt}{\metropolis@frametitle@padding +
424     \totalheightof{
425       \ifcsdef{metropolis@frametitleformat}{\metropolis@frametitleformat X}{X}%
426     }%
427   }%
428 }
429 \newcommand{\metropolis@frametitlestrut@end}{
430   \rule[-\metropolis@frametitle@padding]{0pt}{\metropolis@frametitle@padding}
431 }
432 \defbeamertemplate{frametitle}{plain}{%
433   \nointerlineskip%
434   \begin{beamercolorbox}[%
435     wd=\paperwidth,%
436     sep=0pt,%
437     leftskip=\metropolis@frametitle@padding,%
438     rightskip=\metropolis@frametitle@padding,%
439   ]{frametitle}%
440   \metropolis@frametitlestrut@start%
441   \insertframetitle%
442   \nolinebreak%
443   \metropolis@frametitlestrut@end%
444   \end{beamercolorbox}%
445 }
446 \setbeamertemplate{frametitle continuation}{%
447   \usebeamerfont{frametitle}

```

```

448 \romannumeral \insertcontinuationcount
449 }

```

progress bar in head/foot Template for the progress bar optionally displayed below the frame title on each page. Much of this code is duplicated in the inner theme's template **progress bar in section page**.

```

450 \newlength{\metropolis@progressinheadfoot}
451 \setbeamertemplate{progress bar in head/foot}{
452   \nointerlineskip
453   \setlength{\metropolis@progressinheadfoot}{%
454     \paperwidth * \ratio{\insertframenum pt}{\inserttotalframenum pt}}%
455   }%
456   \begin{beamercolorbox}[wd=\paperwidth]{progress bar in head/foot}
457     \begin{tikzpicture}
458       \fill[bg] (0,0) rectangle (\paperwidth, 0.4pt);
459       \fill[fg] (0,0) rectangle (\metropolis@progressinheadfoot, 0.4pt);
460     \end{tikzpicture}%
461   \end{beamercolorbox}
462 }

```

appendix Removes page numbering and per-slide progress bars when `\appendix` is called. This makes it easier to include additional “backup slides” at the end of the presentation, especially in conjunction with the package `appendixnumberbeamer`.

```

463 \AtBeginDocument{%
464   \apptocmd{\appendix}{%
465     \pgfkeys{%
466       /metropolis/outer/.cd,
467       numbering=none,
468       progressbar=none}
469   }{}{}
470 }

```

8.3.5 Process package options

```

471 \metropolis@outer@setdefaults
472 \ProcessPgfPackageOptions{/metropolis/outer}

```


8.4 metropolis font theme

A beamer font theme sets the style of the font used in the document.

8.4.1 Package dependencies

```
473 \RequirePackage{etoolbox}
474 \RequirePackage{ifxetex}
475 \RequirePackage{ifluatex}
476 \RequirePackage{pgfopts}
```

8.4.2 Load Fira fonts

If the presentation is compiled with Xe \LaTeX or Lua \LaTeX , the fontspec package is loaded and we search for the Fira fonts.

```
477 \ifboolexpr{bool {xetex} or bool {luatex}}{
478   \RequirePackage[no-math]{fontspec}
```

`\checkfont` Checks if a font is installed; if not, `fontsnofound` is increased.

```
479   \newcounter{fontsnofound}
480   \newcommand{\checkfont}[1]{%
481     \suppressfontnotfounderror=1%
482     \font\x = "#1" at 10pt
483     \selectfont
484     \ifx\x\nullfont%
485       \stepcounter{fontsnofound}%
486     \fi%
487     \suppressfontnotfounderror=0%
488   }
489
```

`\iffontsavailable` Resets the `fontsnofound` counter and calls `\checkfont` for each font in the comma separated list in the first argument.

```
490   \newcommand{\iffontsavailable}[3]{%
491     \setcounter{fontsnofound}{0}%
492     \expandafter\forcsvlist\expandafter%
493     \checkfont\expandafter{#1}%
494     \ifnum\value{fontsnofound}=0%
```

```

495     #2%
496     \else%
497     #3%
498     \fi%
499 }

```

We search for regular, italic, light, light italic, mono, and mono bold fonts under the default `Fira Sans` and `Fira Mono` names. If this fails, the suffix `OT` — used by some Linux distributions — will be tried. If this also fails, a warning will be displayed and the standard fonts will be used.

```

500 \iffontsavailable{Fira Sans Light,%
501             Fira Sans Light Italic,%
502             Fira Sans,%
503             Fira Sans Italic}%
504 {%
505     \setsansfont[ItalicFont={Fira Sans Light Italic},%
506             BoldFont={Fira Sans},%
507             BoldItalicFont={Fira Sans Italic}]]%
508             {Fira Sans Light}%
509 }{%
510     \iffontsavailable{Fira Sans Light OT,%
511             Fira Sans Light Italic OT,%
512             Fira Sans OT,%
513             Fira Sans Italic OT}%
514 {%
515     \setsansfont[ItalicFont={Fira Sans Light Italic OT},%
516             BoldFont={Fira Sans OT},%
517             BoldItalicFont={Fira Sans Italic OT}]]%
518             {Fira Sans Light OT}%
519 }{%
520     \PackageWarning{beamerthememetropolis}{%
521         Could not find Fira Sans fonts%
522     }
523 }
524 }
525 \iffontsavailable{Fira Mono, Fira Mono Bold}{%
526     \setmonofont[BoldFont={Fira Mono Medium}]{Fira Mono}%
527 }{%
528     \iffontsavailable{Fira Mono OT, Fira Mono Bold OT}{%

```

```

529     \setmonofont[BoldFont={Fira Mono Medium OT}]{Fira Mono OT}%
530   }{%
531     \PackageWarning{beamerthememetropolis}{%
532       Could not find Fira Mono fonts%
533     }
534   }
535 }
536 \AtBeginEnvironment{tabular}{%
537   \addfontfeature{Numbers={Monospaced}}}%
538 }
539 }{%
540   \PackageWarning{beamerthememetropolis}{%
541     You need to compile with XeLaTeX or LuaLaTeX to use the Fira fonts%
542   }
543 }

```

This concludes the portion of the code which is only run when compiled with XeLaTeX or LuaLaTeX. The remainder of this package applies regardless of the compiling engine.

8.4.3 General font definitions

```

544 \setbeamerfont{title}{size=\Large,%
545               series=\bfseries}
546 \setbeamerfont{author}{size=\small}
547 \setbeamerfont{date}{size=\small}
548 \setbeamerfont{section title}{size=\Large,%
549               series=\bfseries}
550 \setbeamerfont{block title}{size=\normalsize,%
551               series=\bfseries}
552 \setbeamerfont{block title alerted}{size=\normalsize,%
553               series=\bfseries}
554 \setbeamerfont*{subtitle}{size=\large}
555 \setbeamerfont{frametitle}{size=\large,%
556               series=\bfseries}
557 \setbeamerfont{caption}{size=\small}
558 \setbeamerfont{caption name}{series=\bfseries}
559 \setbeamerfont{description item}{series=\bfseries}
560 \setbeamerfont{page number in head/foot}{size=\scriptsize}
561 \setbeamerfont{bibliography entry author}{size=\normalsize,%

```

```

562                                     series=\normalfont}
563 \setbeamerfont{bibliography entry title}{size=\normalsize,%
564                                     series=\bfseries}
565 \setbeamerfont{bibliography entry location}{size=\normalsize,%
566                                     series=\normalfont}
567 \setbeamerfont{bibliography entry note}{size=\small,%
568                                     series=\normalfont}
569 \setbeamerfont{standout}{size=\Large,%
570                                     series=\bfseries}

```

8.4.4 Title format options

`titleformat title` Controls the format of the title.

```

571 \pgfkeys{
572   /metropolis/font/titleformat title/.cd,
573   .is choice,
574   regular/.code={%
575     \let\metropolis@titleformat\@empty%
576     \setbeamerfont{title}{shape=\normalfont}%
577   },
578   smallcaps/.code={%
579     \let\metropolis@titleformat\@empty%
580     \setbeamerfont{title}{shape=\scshape}%
581   },
582   allsmallcaps/.code={%
583     \let\metropolis@titleformat\lowercase%
584     \setbeamerfont{title}{shape=\scshape}%
585     \PackageWarning{beamerthememetropolis}{%
586       Be aware that titleformat title=allsmallcaps can lead to problems%
587     }
588   },
589   allcaps/.code={%
590     \let\metropolis@titleformat\uppercase%
591     \setbeamerfont{title}{shape=\normalfont}
592     \PackageWarning{beamerthememetropolis}{%
593       Be aware that titleformat title=allcaps can lead to problems%
594     }
595   },
596 }

```

`titleformat subtitle` Control the format of the subtitle.

```
597 \pgfkeys{
598   /metropolis/font/titleformat subtitle/.cd,
599   .is choice,
600   regular/.code={%
601     \let\metropolis@subtitleformat\@empty%
602     \setbeamerfont{subtitle}{shape=\normalfont}%
603   },
604   smallcaps/.code={%
605     \let\metropolis@subtitleformat\@empty%
606     \setbeamerfont{subtitle}{shape=\scshape}%
607   },
608   allsmallcaps/.code={%
609     \let\metropolis@subtitleformat\lowercase%
610     \setbeamerfont{subtitle}{shape=\scshape}%
611     \PackageWarning{beamerthememetropolis}{%
612       Be aware that titleformat subtitle=allsmallcaps can lead to problems%
613     }
614   },
615   allcaps/.code={%
616     \let\metropolis@subtitleformat\uppercase%
617     \setbeamerfont{subtitle}{shape=\normalfont}%
618     \PackageWarning{beamerthememetropolis}{%
619       Be aware that titleformat subtitle=allcaps can lead to problems%
620     }
621   },
622 }
```

`titleformat section` Controls the format of the section title.

```
623 \pgfkeys{
624   /metropolis/font/titleformat section/.cd,
625   .is choice,
626   regular/.code={%
627     \let\metropolis@sectiontitleformat\@empty%
628     \setbeamerfont{section title}{shape=\normalfont}%
629   },
630   smallcaps/.code={%
631     \let\metropolis@sectiontitleformat\@empty%
632     \setbeamerfont{section title}{shape=\scshape}%
633   },
634 }
```

```

633     },
634     allsmallcaps/.code={%
635         \let\metropolis@sectiontitleformat\MakeLowercase%
636         \setbeamerfont{section title}{shape=\scshape}%
637         \PackageWarning{beamerthememetropolis}{%
638             Be aware that titleformat section=allsmallcaps can lead to problems%
639         }
640     },
641     allcaps/.code={%
642         \let\metropolis@sectiontitleformat\MakeUppercase%
643         \setbeamerfont{section title}{shape=\normalfont}%
644         \PackageWarning{beamerthememetropolis}{%
645             Be aware that titleformat section=allcaps can lead to problems%
646         }
647     },
648 }

```

frametitleformat Control the format of the frame title.

```

649 \pgfkeys{
650     /metropolis/font/titleformat frame/.cd,
651     .is choice,
652     regular/.code={%
653         \let\metropolis@frametitleformat\@empty%
654         \setbeamerfont{frametitle}{shape=\normalfont}%
655     },
656     smallcaps/.code={%
657         \let\metropolis@frametitleformat\@empty%
658         \setbeamerfont{frametitle}{shape=\scshape}%
659     },
660     allsmallcaps/.code={%
661         \let\metropolis@frametitleformat\MakeLowercase%
662         \setbeamerfont{frametitle}{shape=\scshape}%
663         \PackageWarning{beamerthememetropolis}{%
664             Be aware that titleformat frame=allsmallcaps can lead to problems%
665         }
666     },
667     allcaps/.code={%
668         \let\metropolis@frametitleformat\MakeUppercase%
669         \setbeamerfont{frametitle}{shape=\normalfont}

```

```

670     \PackageWarning{beamerthememetropolis}{%
671         Be aware that titleformat frame=allcaps can lead to problems%
672     }
673 },
674 }

```

`titleformat aliases` Allows `titleformat title` et al. to be used in the `\usetheme` declaration, where L^AT_EX automatically removes all spaces.

```

675 \pgfkeys{
676     /metropolis/font/.cd,
677     titleformattitle/.code=\pgfkeysalso{titleformat title=#1},
678     titleformatsubtitle/.code=\pgfkeysalso{titleformat subtitle=#1},
679     titleformatsection/.code=\pgfkeysalso{titleformat section=#1},
680     titleformatframe/.code=\pgfkeysalso{titleformat frame=#1},
681 }

```

`\metropolis@font@setdefaults` Sets default values for font theme options.

```

682 \newcommand{\metropolis@font@setdefaults}{
683     \pgfkeys{/metropolis/font/.cd,
684         titleformat title=regular,
685         titleformat subtitle=regular,
686         titleformat section=regular,
687         titleformat frame=regular,
688     }
689 }

```

We first define hooks to change the case format of the titles.

```

690 \def\metropolis@titleformat#1{#1}
691 \def\metropolis@subtitleformat#1{#1}
692 \def\metropolis@sectiontitleformat#1{#1}
693 \def\metropolis@frametitleformat#1{#1}

```

To make the uppercase and lowercase macros work in the title, subtitle, etc., we have to patch the appropriate `beamer` commands that set their values. This solution was suggested by Enrico Gregorio in an answer to [this StackExchange question](#).

```

694 \patchcmd{\beamer@title}%

```

```

695 {\def\inserttitle{#2}}%
696 {\def\inserttitle{\metropolis@titleformat{#2}}}%
697 {}%
698 {\PackageError{beamerfontthememetropolis}{Patching title failed}}
699 \patchcmd{\beamer@subtitle}%
700 {\def\insertsubtitle{#2}}%
701 {\def\insertsubtitle{\metropolis@subtitleformat{#2}}}%
702 {}%
703 {\PackageError{beamerfontthememetropolis}{Patching subtitle failed}}
704 \patchcmd{\sectionentry}
705 {\def\insertsectionhead{#2}}
706 {\def\insertsectionhead{\metropolis@sectiontitleformat{#2}}}
707 {}
708 {\PackageError{beamerfontthememetropolis}{Patching section title failed}}
709 \patchcmd{\beamer@section}
710 {\def\insertsectionhead{\hyperlink{Navigation\the\c@page}{#1}}}
711 {\def\insertsectionhead{\hyperlink{Navigation\the\c@page}{%
712   \metropolis@sectiontitleformat{#1}}}}
713 {}
714 {\PackageError{beamerfontthememetropolis}{Patching section title failed}}
715 \patchcmd{\beamer@subsection}
716 {\def\insertsubsectionhead{\hyperlink{Navigation\the\c@page}{#1}}}
717 {\def\insertsubsectionhead{\hyperlink{Navigation\the\c@page}{%
718   \metropolis@sectiontitleformat{#1}}}}
719 {}
720 {\PackageError{beamerfontthememetropolis}{Patching section title failed}}

```

Similarly, to make the `\MakeLowercase` and `\MakeUppercase` macros work in the frame title we have to patch `\beamer@@frametitle`.

```

721 \patchcmd{\beamer@@frametitle}
722 {\beamer@ifempty{#2}{}{%
723   \gdef\insertframetitle{#2\ifnum\beamer@autobreakcount>0\relax{}\space%
724     \usebeamertemplate*{frametitle continuation}\fi}}%
725 \gdef\beamer@frametitle{#2}%
726 \gdef\beamer@shortframetitle{#1}%
727 }}
728 {\beamer@ifempty{#2}{}{%
729   \gdef\insertframetitle{\metropolis@frametitleformat{#2}\ifnum%
730     \beamer@autobreakcount>0\relax{}\space%

```



```

731     \usebeamertemplate*{frametitle continuation}\fi}}%
732     \gdef\beamer@frametitle{#2}%
733     \gdef\beamer@shortframetitle{#1}%
734   }}
735 {}
736 {\PackageError{beamerfontthememetropolis}{Patching frame title failed}}

```

8.4.5 Process package options

```

737 \metropolis@font@setdefaults
738 \ProcessPgfPackageOptions{/metropolis/font}

```

8.5 metropolis color theme

8.5.1 Package dependencies

```

739 \RequirePackage{pgfopts}

```

8.5.2 Options

block Optionally adds a light grey background to block environments like `theorem` and `example`.

```

740 \pgfkeys{
741   /metropolis/color/block/.cd,
742   .is choice,
743   transparent/.code=\metropolis@block@transparent,
744   fill/.code=\metropolis@block@fill,
745 }

```

colors Provides the option to have a dark background and light foreground instead of the reverse.

```

746 \pgfkeys{
747   /metropolis/color/background/.cd,
748   .is choice,
749   dark/.code=\metropolis@colors@dark,
750   light/.code=\metropolis@colors@light,
751 }

```

`\metropolis@color@setdefaults` Sets default values for color theme options.

```

752 \newcommand{\metropolis@color@setdefaults}{
753   \pgfkeys{/metropolis/color/.cd,
754     background=light,
755     block=transparent,
756   }
757 }

```

8.5.3 Base colors

```

758 \definecolor{mDarkBrown}{HTML}{604c38}
759 \definecolor{mDarkTeal}{HTML}{23373b}
760 \definecolor{mLightBrown}{HTML}{EB811B}
761 \definecolor{mLightGreen}{HTML}{14B03D}

```

8.5.4 Base styles

All colors in **metropolis** are derived from the definitions of `normal text`, `alerted text`, and `example text`.

```

762 \newcommand{\metropolis@colors@dark}{
763   \setbeamercolor{normal text}{%
764     fg=black!2,
765     bg=mDarkTeal
766   }
767 }
768 \newcommand{\metropolis@colors@light}{
769   \setbeamercolor{normal text}{%
770     fg=mDarkTeal,
771     bg=black!2
772   }
773 }
774 \setbeamercolor{alerted text}{%
775   fg=mLightBrown
776 }
777 \setbeamercolor{example text}{%
778   fg=mLightGreen
779 }

```

8.5.5 Derived colors

The titles and structural elements (e.g. `itemize` bullets) are set in the same color as `normal text`. This would ideally be done by setting `normal text` as a parent style, which we do to set `titlelike`, but this doesn't work for `structure` as its foreground is set explicitly in `beamercolorthemedefault.sty`.

```
780 \setbeamercolor{titlelike}{use=normal text, parent=normal text}
781 \setbeamercolor{author}{use=normal text, parent=normal text}
782 \setbeamercolor{date}{use=normal text, parent=normal text}
783 \setbeamercolor{institute}{use=normal text, parent=normal text}
784 \setbeamercolor{structure}{use=normal text, fg=normal text.fg}
```

The “primary” palette should be used for the most important navigational elements, and possibly of other elements. **metropolis** uses it for frame titles and slides.

```
785 \setbeamercolor{palette primary}{%
786   use=normal text,
787   fg=normal text.bg,
788   bg=normal text.fg
789 }
790 \setbeamercolor{frametitle}{%
791   use=palette primary,
792   parent=palette primary
793 }
```

The **metropolis** inner or outer themes optionally display progress bars in various locations. Their color is set by `progress bar` but the two different kinds can be customized separately. The horizontal rule on the title page is also set based on the progress bar color and can be customized with `title separator`.

```
794 \setbeamercolor{progress bar}{%
795   use=alerted text,
796   fg=alerted text.fg,
797   bg=alerted text.fg!50!black!30
798 }
799 \setbeamercolor{title separator}{
800   use=progress bar,
801   parent=progress bar
802 }
```

```

803 \setbeamercolor{progress bar in head/foot}{%
804   use=progress bar,
805   parent=progress bar
806 }
807 \setbeamercolor{progress bar in section page}{
808   use=progress bar,
809   parent=progress bar
810 }

```

Block environments such as `theorem` and `example` have no background color by default. The option `block=fill` sets a background color based on the background and foreground of `normal text`. The option `block=transparent` reverts the block environments to an empty background, which can be useful if changing colors mid-presentation.

```

811 \newcommand{\metropolis@block@transparent}{
812   \setbeamercolor{block title}{%
813     use=normal text,
814     fg=normal text.fg,
815     bg=
816   }
817   \setbeamercolor{block body}{
818     bg=
819   }
820 }
821 \newcommand{\metropolis@block@fill}{
822   \setbeamercolor{block title}{%
823     use=normal text,
824     fg=normal text.fg,
825     bg=normal text.bg!80!fg
826   }
827   \setbeamercolor{block body}{
828     use={block title, normal text},
829     bg=block title.bg!50!normal text.bg
830   }
831 }
832 \setbeamercolor{block title alerted}{%
833   use={block title, alerted text},
834   bg=block title.bg,
835   fg=alerted text.fg

```

```

836 }
837 \setbeamercolor{block title example}{%
838     use={block title, example text},
839     bg=block title.bg,
840     fg=example text.fg
841 }
842 \setbeamercolor{block body alerted}{use=block body, parent=block body}
843 \setbeamercolor{block body example}{use=block body, parent=block body}

```

Footnotes

```

844 \setbeamercolor{footnote}{fg=normal text.fg!90}
845 \setbeamercolor{footnote mark}{fg=..}

```

8.5.6 Process package options

```

846 \metropolis@color@setdefaults
847 \ProcessPgfPackageOptions{/metropolis/color}
848 \mode<all>

```

8.6 Tol pgfplots theme

Paul Tol’s 12-color palette¹ is as follows:

```

849 \definecolor{TolDarkPurple}{HTML}{332288}
850 \definecolor{TolDarkBlue}{HTML}{6699CC}
851 \definecolor{TolLightBlue}{HTML}{88CCFF}
852 \definecolor{TolLightGreen}{HTML}{44AA99}
853 \definecolor{TolDarkGreen}{HTML}{117733}
854 \definecolor{TolDarkBrown}{HTML}{999933}
855 \definecolor{TolLightBrown}{HTML}{DDCC77}
856 \definecolor{TolDarkRed}{HTML}{661100}
857 \definecolor{TolLightRed}{HTML}{CC6677}
858 \definecolor{TolLightPink}{HTML}{AA4466}
859 \definecolor{TolDarkPink}{HTML}{882255}
860 \definecolor{TolLightPurple}{HTML}{AA4499}

```

To use these colors, we describe “cycle lists” from which PGF chooses styles for the different series in a chart.

¹Tol actually describes several palettes; these colours are taken from the bottom row of Figure 3 in his technical note.

`mbarplot cycle` Colors and styles intended for bar charts with up to 12 series.

```
861 \pgfplotscreateplotcyclelist{mbarplot cycle}{%
862 {draw=TolDarkBlue, fill=TolDarkBlue!70},
863 {draw=TolLightBrown, fill=TolLightBrown!70},
864 {draw=TolLightGreen, fill=TolLightGreen!70},
865 {draw=TolDarkPink, fill=TolDarkPink!70},
866 {draw=TolDarkPurple, fill=TolDarkPurple!70},
867 {draw=TolDarkRed, fill=TolDarkRed!70},
868 {draw=TolDarkBrown, fill=TolDarkBrown!70},
869 {draw=TolLightRed, fill=TolLightRed!70},
870 {draw=TolLightPink, fill=TolLightPink!70},
871 {draw=TolLightPurple, fill=TolLightPurple!70},
872 {draw=TolLightBlue, fill=TolLightBlue!70},
873 {draw=TolDarkGreen, fill=TolDarkGreen!70},
874 }
```

`mlineplot cycle` Colors and styles intended for line charts with up to 4 series.

```
875 \pgfplotscreateplotcyclelist{mlineplot cycle}{%
876 {TolDarkBlue, mark=*, mark size=1.5pt},
877 {TolLightBrown, mark=square*, mark size=1.3pt},
878 {TolLightGreen, mark=triangle*, mark size=1.5pt},
879 {TolDarkBrown, mark=diamond*, mark size=1.5pt},
880 }
```

However, the above cycle lists are not applied automatically. We still need to define styles — `mlineplot` and `mbarplot` — that the user can apply to the axis of a `pgfplots` chart to use the colors. We'll also take the opportunity to adjust the display of chart axes when these styles are used.

```
881 \pgfplotsset{
882 compat=1.9,
```

`mlineplot` A style to apply to the axis of a PGF line plot.

```
883 mlineplot/.style={
884 mbaseplot,
885 xmajorgrids=true,
886 ymajorgrids=true,
887 major grid style={dotted},
```

```

888     axis x line=bottom,
889     axis y line=left,
890     legend style={
891         cells={anchor=west},
892         draw=none
893     },
894     cycle list name=mlineplot cycle,
895 },

```

`mbarplot` A style to apply to the axis of a PGF bar chart. `mbarplot` uses vertical bars by default, while `horizontal mbarplot` has horizontal bars as the name implies. Their shared properties are factored out into the internal style `mbarplot base`.

```

896 mbarplot base/.style={
897     mbaseplot,
898     bar width=6pt,
899     axis y line*=none,
900 },
901 mbarplot/.style={
902     mbarplot base,
903     ybar,
904     xmajorgrids=false,
905     ymajorgrids=true,
906     area legend,
907     legend image code/.code={%
908         \draw[#1] (0cm,-0.1cm) rectangle (0.15cm,0.1cm);
909     },
910     cycle list name=mbarplot cycle,
911 },
912 horizontal mbarplot/.style={
913     mbarplot base,
914     xmajorgrids=true,
915     ymajorgrids=false,
916     xbar stacked,
917     area legend,
918     legend image code/.code={%
919         \draw[#1] (0cm,-0.1cm) rectangle (0.15cm,0.1cm);
920     },
921     cycle list name=mbarplot cycle,
922 },

```

`mbaseplot` Adjusts the appearance of the axes in a PGF chart.

```
923 mbaseplot/.style={
924     legend style={
925         draw=none,
926         fill=none,
927         cells={anchor=west},
928     },
929     x tick label style={
930         font=\footnotesize
931     },
932     y tick label style={
933         font=\footnotesize
934     },
935     legend style={
936         font=\footnotesize
937     },
938     major grid style={
939         dotted,
940     },
941     axis x line*=bottom,
942 },
943 disable thousands separator/.style={
944     /pgf/number format/.cd,
945     1000 sep={}
946 },
947 }
```