Any color you like

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\LaTeX\ Project

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Background

- \TeX\ requires specials for color
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- But there is more to color
- Aim to bring ideas together
- Also use new(er) engine features
Abstracting engine color

From an explicit model

\color_{select:nn} \{ rgb \}
\{ 0.123 , 0.456 , 0.678 \}
Abstracting engine color

From an explicit model
\[ \texttt{\color{rgb} { 0.123 , 0.456 , 0.678 } } \]

or from a named color
\[ \texttt{\color{blue} } \]
Mixtures

Most people would prefer \color_select:n \{ red!20!blue \} over \color_select:nn \{ rgb \} \{ 0.2 , 0.0 , 0.8 \}
Color models

There are various color models

- Grayscale (gray)
- Red–green–blue (rgb)
- Cyan–magenta–yellow–black (cmyk)
There are various color models

- Grayscale (gray)
- Red–green–blue (rgb)
- Cyan–magenta–yellow–black (cmyk)
- Hue-saturation-brightness (hsb)
- HTML-format (HTML)
- Integer red–green–blue (RGB)
Mixing models

When we mix, the first \textit{native} model wins

\texttt{\textbackslash color\_set:nn \{ test \} \{ red!25!cyan \}}
\texttt{\textbackslash color\_show:n \{ test \}}
Mixing models

When we mix, the first *native* model wins
\color_set:nn \{ test \} \{ red!25!cyan \}
\color_show:n \{ test \}
gives

The color foo has the properties:
> model => rgb
> rgb => 0.25 0.75 0.75.
Converting models

As we’ve seen the package can convert between models.
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We can provide explicit data for multiple models
\color_set:nnn { test } { cmyk / rgb }
{ 0.1 , 0.2 , 0.3 , 0.4 / 0.1, 0.2 , 0.3 }
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And we can export the information
\color_export:nnN { red!33!green!10 }
{ HTML } \l_tmpa_tl
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And we can export the information
\color_export:nnN \{ red!33!green!10 \}
\{ HTML \} \l_tmpa_tl
> \l_tmpa_tl=macro:
->EEF7E6.
Color spaces and spots

In print, we might need defined inks: *spot* colors

\color_model_new:nnn

{ BarTone }

{ Separation }

{ 
  name = BarTone~555~GN ,
  alternative-model = rgb ,
  alternative-values = { 0.123 , 0.456, 0.789 }
}


Color spaces and spots

We might also want device-independent CIELAB colors

```
\color_model_new:nnn
{ BarToneCIELAB }
{ Separation }
{
    name = BarTone~555~GN ,
    alternative-model = CIELAB ,
    alternative-values = \{50, -30, -40\},
    illuminant = d65
}
```
Color spaces and spots

Or DeviceN spaces

\color_model_new:nnn \{ AllIn \} \{ DeviceN \}
{
    names =
    \{ BarTone , cyan , magenta , yellow , black \}
}
Fills, strokes and stacks

- pdf\TeX{} and Lua\TeX{} have multiple color stacks
- So does up-to-date dvipdfmx
- These are really graphic state stacks!
- We can use them to (better) manage fill and stroke color
(Toward) color profiles

```
\color_iccprofile_apply:nn { rgb }
   { sRGB_v4_ICC_preference.icc }
```

or

```
\color_model_new:nnn { ICC } { ICCBased }
   { file = sRGB_v4_ICC_preference.icc }
```

Still pull requests at present!
Avoiding whatsits

In Lua\TeX\ we can use attributes to manage color

Likely to use that for l3color on Lua\TeX\ generally:
Avoiding whatsits

In \texttt{Lua\TeX} we can use attributes to manage color

Likely to use that for \texttt{l3color} on \texttt{Lua\TeX} generally: \texttt{\LaTeX\ 2\epsilon} a bigger question!
Summary

- Single set of interfaces
- Take existing ideas and bring in new features
- A chance to explore what’s possible