

# @prism project

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29 Oct 2025 – Version 1.2.0

The @prism project<sup>1</sup> provides small size color palettes that can be used to create expressive color maps for graphics in different contexts.

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## Last changes

### ⬆ Break.

- Palettes: all final palettes now consist of 10 colors.
- luadraw products: the `getPal` dictionary array has been converted into a function accepting string palette names (with or without `pal` prefix). See below.

### ⬇ New.

- Palettes.
  - Added `Lemon` and `ShiftRainbow` palettes (`luadraw` creation process used).
  - Added 37 palettes from the `Scientific Colour Maps` project.
- `luadraw` product: the `getPal` function has an optional argument `options` (dict-like array) with the following keys and their values.
  - `extract`: a list of non-zero integers used to extract specific colors from the palette (the order is preserved).
  - `reverse`: a boolean value indicating whether to reverse the palette color order (`false` by default).
  - `shift`: an integer value for applying a circular color shift to the palette.
- Documentations
  - Added English PDF manual.
  - Showcase: two PDF files demonstrate the use of each palette (white and dark modes).

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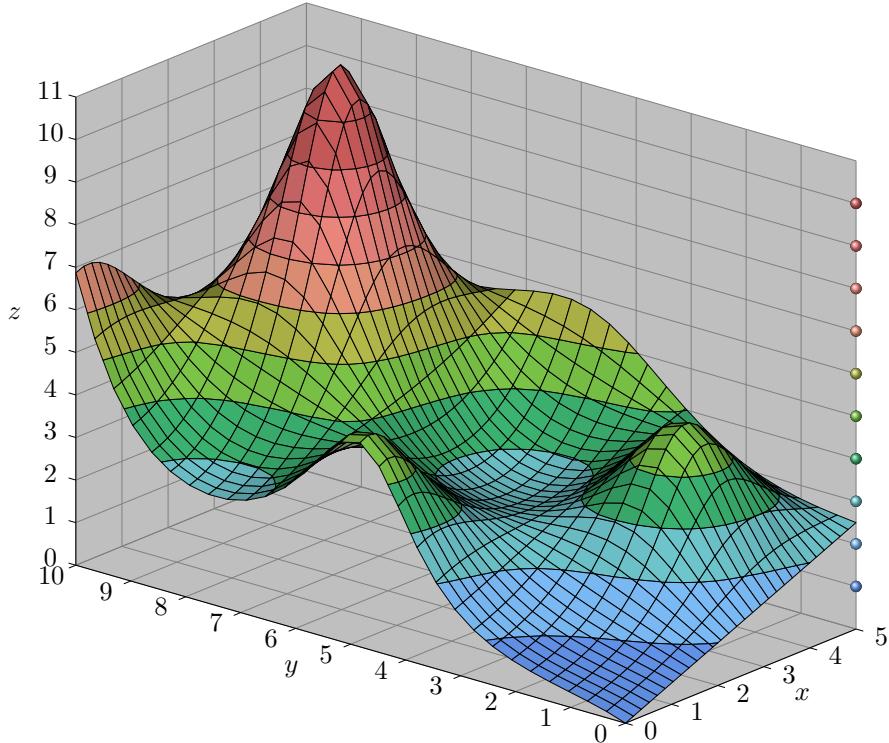
<sup>1</sup>The name comes from “@ · esthetic P · roducts for R · epresenting I · nformative S · cientific M · aps”. This name is a double play on words: [1] a prism is where light is split into an informative spectrum, symbolizing how data or visuals are decomposed into meaningful color and style, and [2] where light meets the prism, it breaks down into an informative spectrum (“@” can be read “at”).

# Contents

<b>I. Motivations</b>	<b>3</b>
<b>II. Where do the color palettes come from?</b>	<b>4</b>
<b>III. Reuse from...</b>	<b>4</b>
1. Matplotlib	4
2. Asymptote and Scientific Coulour Maps	4
<b>IV. How to choose a palette?</b>	<b>4</b>
<b>V. Supported implementations</b>	<b>4</b>
1. JSON, the versatile default format	4
2. luadraw palettes	5
a. Description	5
b. Use a luadraw palette	5
<b>VI. Contribute via Git</b>	<b>6</b>
1. Complete the translations	6
a. The en folder	6
b. The changes folder	6
c. The status folder	6
d. The README.md and LICENCE.txt files	7
e. New translations	7
2. Improving the source code	7
<b>VII. History</b>	<b>7</b>

## I. Motivations

Originally, this project was born out of a desire to enhance [luadraw](#) with a set of color palettes to easily produce something like the following 3D plot.



Technically, a finite list of colors is provided to [luadraw](#) which then uses linear interpolation to calculate the intermediate colors. In the previous case, the finite color palette used is defined as follows.

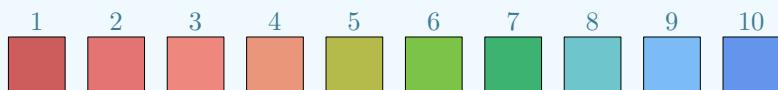


Using this palette, [luadraw](#) is able to produce the following spectrum, allowing us to create the graph above.

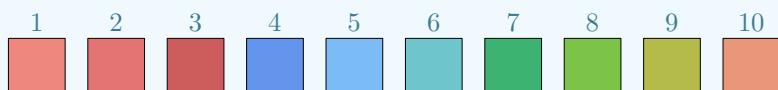


### Note.

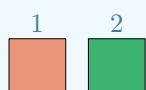
Using the [luadraw](#) implementation of `@prism`, see the section V-2, we can display the palettes below made from the previous one named '`'GeoRainbow'`'. Each instruction used is given below each palette.



`getPal('GeoRainbow', {reverse = true})`



`getPal('GeoRainbow', {shift = 3})`



`getPal('GeoRainbow', {extract = {7, 15, 4}})`

## II. Where do the color palettes come from?

Most color palettes are obtained from [Matplotlib](#) and [Scientific Colour Maps](#) by segmenting their color maps into 10 values.<sup>2</sup> We retain only palettes that comply with the following rules.

- **No repetition.** Some [Matplotlib](#) palettes are duplicated,<sup>3</sup> in which case we keep the first one in lexicographical order.
- **No reversed versions.** Unlike [Matplotlib](#),<sup>4</sup> [Coprism](#) never includes reversed palettes as fixed data.

In addition to [Matplotlib](#) and [Scientific Colour Maps](#) palettes, [Coprism](#) includes original creations.



*To contribute palettes, see section VI-2.*

## III. Reuse from...

### 1. Matplotlib

Here are the key points to remember when using a palette similar to those offered by [Matplotlib](#).

1. [Coprism](#) uses standardized CamelCase notation. Therefore, [Matplotlib](#) palette names such as `berlin` and `gist_heat` become `Berlin` and `GistHeat` respectively.
2. All names ending with the `_r` suffix correspond to reversed color order. These palettes are not included in the [Coprism](#) project. However, the implementations provide methods to easily obtain reversed palettes, sub-palettes, and color-shifted palettes.

### 2. Asymptote and Scientific Colour Maps

Simply apply the naming standardization explained in the previous section (see point 1).

## IV. How to choose a palette?

The complete set of 127 palettes is visible in use cases in the following documents.

1. `showcase-en-std.pdf` is a document using a colored theme on a white background.
2. `showcase-en-dark.pdf` is a document using a colored theme on a black background.



*In the files `similar-palettes-en-std.pdf` and `similar-palettes-en-dark.pdf`, you can find perceptually similar palettes.*

## V. Supported implementations

The implementations are inside the folder `products`.

### 1. JSON, the versatile default format

By default, a file `palettes.json` is provided to allow unsupported coding languages to also integrate [Coprism](#) palettes. Here are the first line of this file.

```
{  
    "Accent": [  
        [0.498039, 0.788235, 0.498039],  
        [0.690196, 0.705881, 0.757298],  
        [0.882352, 0.721568, 0.661437],
```

<sup>2</sup>[Asymptote](#) is also used, but currently offers nothing beyond [Matplotlib](#), despite different implementations.

<sup>3</sup>Likely for historical reasons.

<sup>4</sup>Most [Matplotlib](#) color maps have a reversed version named with the `_r` suffix, possibly for performance reasons.

```

[0.99477, 0.835294, 0.550326],
[0.913289, 0.935947, 0.610021],
[0.306317, 0.487581, 0.680174],
[0.700653, 0.146404, 0.562091],
[0.855772, 0.162962, 0.316775],
[0.671459, 0.366448, 0.159041],
[0.4, 0.4, 0.4]
],
...
}

```

## 2. luadraw palettes

### a. Description

You can use `@prism` palettes with `luadraw` which is a package that greatly facilitates the creation of high-quality 2D and 3D plots via `Lua` and `TikZ`.

 Note.

*Initially, the `@prism` project was created to provide ready-to-use palettes for `luadraw`.*

### b. Use a luadraw palette

The `Lua` palette names all use the prefix `pal` followed by the name available in the file `palettes.json`. You can access a palette by two ways.

- `palGistHeat` is a `Lua` variable.
- `getPal('GistHeat')` and `getPal('palGistHeat')` are equal to `palGistHeat`.

 Note.

*The `Lua` palette variables are arrays of arrays of three floats. Here is the definition of `palGistHeat`.*

```

palGistHeat = {
  {0.0, 0.0, 0.0},
  {0.105882, 0.0, 0.0},
  {0.211764, 0.0, 0.0},
  {0.317647, 0.0, 0.0},
  {0.429411, 0.0, 0.0},
  {0.535294, 0.0, 0.0},
  {0.641176, 0.0, 0.0},
  {0.752941, 0.003921, 0.0},
  {0.858823, 0.145098, 0.0},
  {0.964705, 0.286274, 0.0},
  {1.0, 0.42745, 0.0},
  {1.0, 0.57647, 0.152941},
  {1.0, 0.717647, 0.435294},
  {1.0, 0.858823, 0.717647},
  {1.0, 1.0, 1.0}
}

```

There are also some options. To explain how this works, let's consider the following use case.

```

mypal = getPal(
  'GistHeat',
  {
    extract = {2, 5, 8, 9},
    shift   = 1,
    reverse = true
  }
)

```

To simplify the explanations, we will refer to the colors in the standard palette 'GistHeat' as `coul_1`, `coul_2`, etc. The options are then **processed in the following order**.

1. `{coul_2, coul_5, coul_8, coul_9}` is the result of the extraction.
2. `{coul_9, coul_2, coul_5, coul_8}` comes from the shifting applied to the extracted palette (colors move to the right if `shift` is positive).
3. `{coul_8, coul_5, coul_2, coul_9}` is the reversed version of the shifted palette.

#### Caution.

*The current version of `luadraw` simply uses the palettes provided by `@prism`. If you prefer to use the `@prism` version with its `getPal` function, you will need to include the entire code in the `luadraw` file where the package is installed.*

## VI. Contribute via Git

#### Caution.

*Never use the `main` branch, which is for freezing the latest stable versions of projects in the mono repository <https://github.com/projetmbc/for-writing>.*

### 1. Complete the translations

#### Important.

*Although we're going to explain how to translate the documentation, it doesn't seem relevant to do so, as English should suffice these days.*

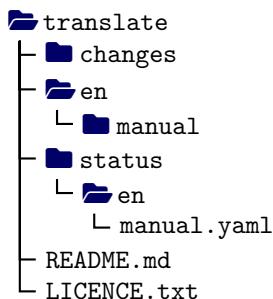


Figure 1: Simplified view of the translation folder

The translations are roughly organized as in figure 1 where just the important folders for the translations have been “*opened*”.<sup>5</sup> **A little further down, the section VI-1-e explains how to add new translations.**

#### a. The `en` folder

This folder, managed by the author of `@prism`, contains files easy to translate even if you're not a coder.

#### b. The `changes` folder

This folder is a communication tool where important changes are indicated without dwelling on minor modifications specific to one or more translations.

#### c. The `status` folder

This folder is used to keep track of translations from the project's point of view. Everything is done via well-commented YAML files, readable by a non-coder.

<sup>5</sup>This was the organization on October 26, 2025.

#### d. The README.md and LICENCE.txt files

The LICENCE.txt file is aptly named, while the README.md file takes up in English the important points of what is said in this section about new translations.

#### e. New translations



*The folder manual is reserved for documentation. It contains TEX files that can be compiled directly for real-time validation of translations.*



*Only start from the en folder, as it's the responsibility of the @prism author.*

**Let's say you want to add support for Italian from files written in English.<sup>6</sup>** To do this, you must use [Git](#) as follows.

1. Via <https://github.com/projetmbc/for-writing/tree/aprism/@prism>, recover the entire project folder. Do not use the main branch, which is used to freeze the latest stable versions of projects in the mono repository <https://github.com/projetmbc/for-writing>.
2. In the @prism/contrib/translate folder, create an it copy of the en folder, where it is the short name of the language documented in the page "*IETF language tag*" from Wikipedia.
3. Once the translation is complete in the it folder, share it via <https://github.com/projetmbc/for-writing/tree/aprism/@prism> using a classic git push.

## 2. Improving the source code

Participation as a coder is made via the repository <https://github.com/projetmbc/for-writing/tree/aprism/@prism> corresponding to the @prism development branch. Here is what you can do, details can be found in the file <https://github.com/projetmbc/for-writing/blob/aprism/@prism/contrib/products/README.md>.

1. Create new palettes within an existing implementation.
2. Propose a new implementation.
3. Combine both approaches above.

## VII. History

### 1.2.0 2025-10-29

#### Break.

- Palettes: all final palettes now consist of 10 colors.
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#### New.

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  - `reverse`: a boolean value indicating whether to reverse the palette color order (`false` by default).
  - `shift`: an integer value for applying a circular color shift to the palette.
- Documentations
  - Added English PDF manual.
  - Showcase: two PDF files demonstrate the use of each palette (white and dark modes).

<sup>6</sup>As mentioned above, there is no real need for the `doc` folder.

1.1.0  
2025-10-14

## ⚠ Break.

- Duplicate palettes and those that are reverse of others are ignored (strict equalities only).

## ⚠ New.

- New palettes added: `BurningGrass`, `GeoRainbow` and `PastelRainbow` (`luadraw` package creation process used).
- The `luadraw` palette product has a new dictionary like variable `getPal` to access a palette using its name (as a string variable).

## ⟳ Update.

- Palette contributions: in the mandatory `extend.py` file, the `build_code` function must work with the dictionary of all the palettes, and manage a credit to the `@prism` project.

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1.0.0  
2025-10-11

## ⚡ First public version of the project.