# Open-source projects for Earth Engine in Python, R, JavaScript, and Julia

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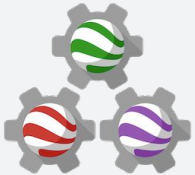
# Earth Engine Extensions

**QGIS Earth Engine Plugin** @gena et al. | *Integrates Google Earth Engine and QGIS using Python API*



**EarthEngine.jl** @KMarkert | *Google Earth Engine in Julia*



**Earth Engine API** | *Original APIs for Python and JavaScript (Code Editor)*



**geemap** @giswqs | *A Python package for interactive mapping with Google Earth Engine, ipyleaflet, and ipywidgets*


**rgee** @csaybar | *rgee is an R binding package for calling Google Earth Engine API from within R*

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# Common EE Python code

from

```
def cloudMask(img):
        qa = img.select('QA60')
        cloudBitMask = 1 << 10
        cirrusBitMask = 1 << 11
        mask = qa.bitwiseAnd(cloudBitMask).eq(0)
                .And(qa.bitwiseAnd(cirrusBitMask).eq(0))
        return img.updateMask(mask)

def scale(img):
        scaling = img.select(["B.*"])
        x = scaling.multiply(0.0001)
        scaling = img.select(["AOT", "WVP"])
        x = x.addBands(scaling.multiply(0.001))
        notScaling = img.select(["SCL", "T.*", "M.*", "Q.*"])
        x = x.addBands(notScaling)
        return x

def addIndices(img):
        a = img.normalizedDifference(['B8','B4']).rename('NDVI')
        b = img.normalizedDifference(['B8','B3']).rename('GNDVI')
        c = img.normalizedDifference(['B3','B11']).rename('NDSI')
        return img.addBands([a,b,c])

S2 = ee.ImageCollection("COPERNICUS/S2_SR") \
        .map(cloudMask) \
        .map(scale) \
        .map(addIndices)
```

# A more intuitive code

to


A python package that extends
Google Earth Engine

```
S2 = ee.ImageCollection("COPERNICUS/S2_SR") \
        .maskClouds() \
        .scaleAndOffset() \
        .spectralIndices(["NDVI", "GNDVI", "NDSI"])
```

# The eeExtra Ecosystem

+ @csaybar (César Aybar Camacho)

**eeExtra** @davemlz @csaybar | *A ninja python package that unifies the Google Earth Engine ecosystem*

**QGIS Earth Engine Plugin** @gena et al. | *Integrates Google Earth Engine and QGIS using Python API*


**eemont** @davemlz | *A python package that extends Google Earth Engine*

**EarthEngine.jl** @KMarkert | *Google Earth Engine in Julia*


**rgeeExtra** @csaybar | *High-level functions to process spatial and simple Earth Engine objects*

## Resources that can be associated

## Directly Associated Packages

# Unifying the Earth Engine Ecosystem


```python
S2 = ee.ImageCollection("COPERNICUS/S2_SR") \
    .maskClouds() \
    .scaleAndOffset() \
    .spectralIndices(["NDVI","kNDVI"])
```


```r
S2 <- ee$ImageCollection$Dataset$COPERNICUS_S2_SR %>%
    ee_ImageCollection_maskClouds() %>%
    ee_ImageCollection_scaleAndOffset() %>%
    ee_ImageCollection_spectralIndex(c("NDVI", "kNDVI"))
```


```julia
S2 = EE.ImageCollection("COPERNICUS/S2_SR") |>
    maskClouds |>
    scaleAndOffset |>
    x -> spectralIndices(x, ["NDVI", "kNDVI"]);
```



```r
S2 <- ee$ImageCollection("COPERNICUS/S2_SR") %>%
    ee$ImageCollection$maskClouds() %>%
    ee$ImageCollection$scaleAndOffset() %>%
    ee$ImageCollection$spectralIndices(c("NDVI", "kNDVI"))
```

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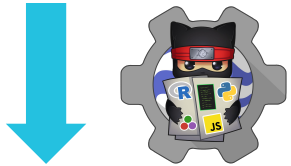
# Experimental: From JS to the world

```
var LandsatLST = require("users/sofiaermida/landsat_smw_lst:modules/Landsat_LST.js");
```




```
LandsatLST = ee.require("users/sofiaermida/landsat_smw_lst:modules/Landsat_LST.js")
```

```
LandsatLST <- module("users/sofiaermida/landsat_smw_lst:modules/Landsat_LST.js")
```

```
LandsatLST = ee.require("users/sofiaermida/landsat_smw_lst:modules/Landsat_LST.js")
```

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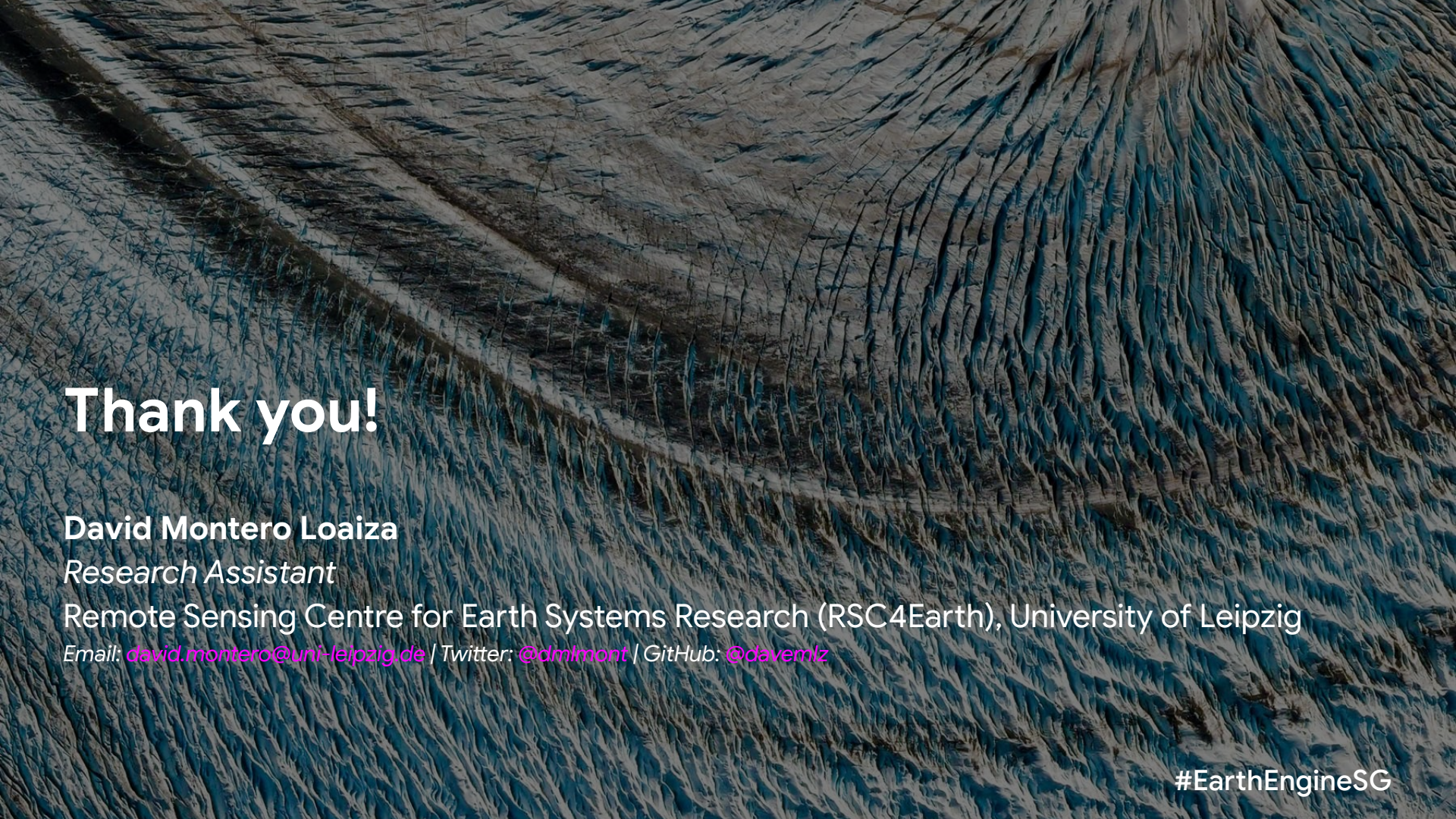
# Contributions are welcome!



# Thank you!

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