

# Package ‘alabaster.spatial’

November 13, 2025

**Title** Save and Load Spatial 'Omics Data to/from File

**Description** Save SpatialExperiment objects and their images into file artifacts, and load them back into memory.

This is a more portable alternative to serialization of such objects into RDS files.

Each artifact is associated with metadata for further interpretation;

downstream applications can enrich this metadata with context-specific properties.

**Version** 1.10.0

**Date** 2024-11-09

**License** MIT + file LICENSE

**Depends** SpatialExperiment, alabaster.base

**Imports** methods, utils, grDevices, S4Vectors, alabaster.sce, rhdf5

**Suggests** testthat, knitr, rmarkdown, BiocStyle, DropletUtils, magick, png, digest

**VignetteBuilder** knitr

**RoxygenNote** 7.3.2

**biocViews** DataImport, DataRepresentation

**git\_url** <https://git.bioconductor.org/packages/alabaster.spatial>

**git\_branch** RELEASE\_3\_22

**git\_last\_commit** d3f2737

**git\_last\_commit\_date** 2025-10-29

**Repository** Bioconductor 3.22

**Date/Publication** 2025-11-13

**Author** Aaron Lun [aut, cre]

**Maintainer** Aaron Lun <[infinite.monkeys.with.keyboards@gmail.com](mailto:infinite.monkeys.with.keyboards@gmail.com)>

## Contents

|                                               |   |
|-----------------------------------------------|---|
| loadSpatialImage . . . . .                    | 2 |
| readSpatialExperiment . . . . .               | 2 |
| saveObject,SpatialExperiment-method . . . . . | 3 |
| stageSpatialImage . . . . .                   | 4 |

|              |          |
|--------------|----------|
| <b>Index</b> | <b>6</b> |
|--------------|----------|

loadSpatialImage      *Load a spatial image*

---

### Description

Load an image as a [SpatialImage](#) or subclass thereof.

### Usage

```
loadSpatialImage(img.info, project)
```

### Arguments

|          |                                                    |
|----------|----------------------------------------------------|
| img.info | Named list containing the metadata for this assay. |
| project  | Object specifying the project of interest.         |

### Value

A [SpatialImage](#) containing the image data (or a reference to it).

### Author(s)

Aaron Lun

### Examples

```
example(read10xVisium, echo=FALSE)
img <- imgData(spe)$data[[1]]

tmp <- tempfile()
dir.create(tmp)
meta <- stageObject(img, tmp, "whee")

out <- loadSpatialImage(meta, tmp)
```

---

readSpatialExperiment      *Read a SpatialExperiment from disk*

---

### Description

Read a [SpatialExperiment](#) object from its on-disk representation.

### Usage

```
readSpatialExperiment(path, metadata, ...)
```

**Arguments**

|          |                                                                                                                                                    |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| path     | String containing a path to a directory, itself created using the <a href="#">saveObject</a> method for <a href="#">SpatialExperiment</a> objects. |
| metadata | Named list of metadata for this object, see <a href="#">readObjectFile</a> for details.                                                            |
| ...      | Further arguments passed to <a href="#">readSingleCellExperiment</a> and internal <a href="#">altReadObject</a> calls.                             |

**Value**

A [SpatialExperiment](#) object.

**Author(s)**

Aaron Lun

**See Also**

"[saveObject,SpatialExperiment-method](#)", to save a [SpatialExperiment](#) to disk.

**Examples**

```
library(SpatialExperiment)
example(read10xVisium, echo=FALSE)

tmp <- tempfile()
saveObject(spe, tmp)
readObject(tmp)
```

---

saveObject,SpatialExperiment-method  
*Save a spatial experiment*

---

**Description**

Save a [SpatialExperiment](#) object to its on-disk representation.

**Usage**

```
## S4 method for signature 'SpatialExperiment'
saveObject(x, path, ...)
```

**Arguments**

|      |                                                               |
|------|---------------------------------------------------------------|
| x    | A <a href="#">SpatialExperiment</a> object.                   |
| path | String containing the path to a directory in which to save x. |
| ...  | Additional named arguments to pass to specific methods.       |

**Details**

Currently, only PNG and TIFF image formats are supported in the [imgData](#). All other images will be re-saved as PNG.

**Value**

x is saved to path and NULL is invisibly returned.

**Author(s)**

Aaron Lun

**See Also**

[readSpatialExperiment](#), to read the SpatialExperiment back into the R session.

**Examples**

```
library(SpatialExperiment)
example(read10xVisium, echo=FALSE)

tmp <- tempfile()
saveObject(spe, tmp)
list.files(tmp, recursive=TRUE)
```

---

|                   |                                |
|-------------------|--------------------------------|
| stageSpatialImage | <i>Stage images for upload</i> |
|-------------------|--------------------------------|

---

**Description**

These methods are deprecated and are only documented here for back-compatibility purposes.

**Usage**

```
## S4 method for signature 'VirtualSpatialImage'
stageObject(x, dir, path, child = FALSE, ...)

## S4 method for signature 'StoredSpatialImage'
stageObject(x, dir, path, child = FALSE, ...)

## S4 method for signature 'RemoteSpatialImage'
stageObject(x, dir, path, child = FALSE, ...)
```

**Arguments**

|       |                                                                   |
|-------|-------------------------------------------------------------------|
| x     | A <a href="#">SpatialImage</a> object.                            |
| dir   | String containing a path to a directory.                          |
| path  | String containing a relative path inside a directory.             |
| child | Logical scalar indicating whether x is a child of another object. |
| ...   | Further arguments, ignored.                                       |

## Details

Each of the different methods will take advantage of any existing files to avoid an actual save. For example, the [RemoteSpatialImage](#) method will download the file directly to path, while the [StoredSpatialImage](#) method will create a link or copy the file. The [SpatialImage](#) method will fall back to saving the raster directly as a PNG.

## Value

An image file is created at `file.path(dir, path)`, possibly after appending an appropriate file extension.

The return value should be a named list containing at least:

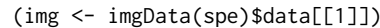
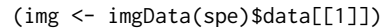
- `$schema`, a string specifying the schema to use to validate the metadata. This may have a package attribute to specify the package where the schema lives (in its `inst/schemas` directory).
- `path`, a string containing the path to the file containing the assay contents. This should start with the input path but can be followed by any necessary file extensions.
- `child`, whether this is a child resource of a larger object.

Other fields can be provided and will be included in the metadata, provided that they are recognized by the specified schema.

## Author(s)

Aaron Lun

## Examples

```
example(read10xVisium, echo=FALSE)



# Doing a local run:
tmp <- tempfile()
dir.create(tmp)
stageObject(img, tmp, "whee")

# Forcing a re-save:
Y <- as(img, "LoadedSpatialImage")
stageObject(Y, tmp, "foo")
```

# Index

altReadObject, [3](#)

imgData, [3](#)

loadSpatialExperiment  
    (readSpatialExperiment), [2](#)

loadSpatialImage, [2](#)

readObjectFile, [3](#)

readSingleCellExperiment, [3](#)

readSpatialExperiment, [2](#), [4](#)

RemoteSpatialImage, [5](#)

saveObject, [3](#)

saveObject, SpatialExperiment-method, [3](#)

SpatialExperiment, [2](#), [3](#)

SpatialImage, [2](#), [4](#), [5](#)

stageObject, RemoteSpatialImage-method  
    (stageSpatialImage), [4](#)

stageObject, SpatialExperiment-method  
    (saveObject, SpatialExperiment-method),  
    [3](#)

stageObject, StoredSpatialImage-method  
    (stageSpatialImage), [4](#)

stageObject, VirtualSpatialImage-method  
    (stageSpatialImage), [4](#)

stageSpatialImage, [4](#)

StoredSpatialImage, [5](#)