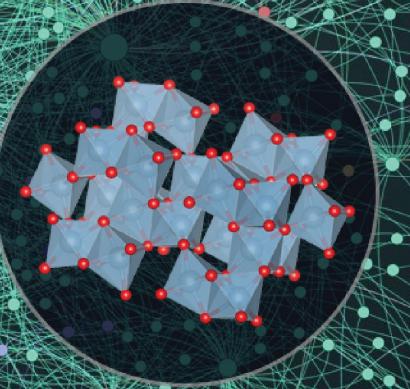
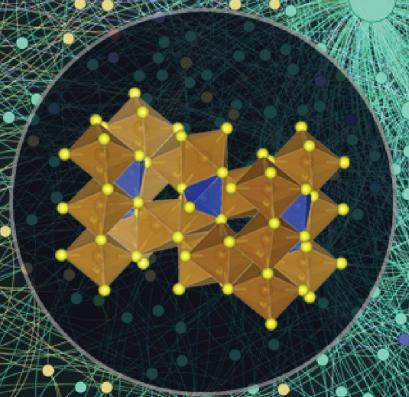


# 2 pt statistics



# PyMKS is a powerful library to carry out 2 pt statistics



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version:  
0.4.1+11.g5aeb56c.dirty

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## PyMKS Introduction

In this notebook, we are demonstrating simple case studies for calculating 2-point spatial correlations on an experimental microstructure as well as synthetic microstructures. First, we will demonstrate how to calculate spatial correlations for a single 2 phase experimental image. Then, we will demonstrate the most efficient way to calculate 2-point spatial correlations on multiple microstructures without using any for-loops. We will only use common python packages like Numpy, Scikit-learn, and Matplotlib for this introductory notebook. For parallel computation PyMKS uses Dask, but we will not be using Dask in this Notebook. Please see the [Effective Stiffness of a Composite Material example](#) or [Effective Stiffness of Fiber Composite](#) notebooks that both implement parallel workflows using Scikit-learn pipelines.

Importing the necessary packages.

```
[1]: import warnings
warnings.filterwarnings('ignore')
import numpy as np
import matplotlib.pyplot as plt
from sklearn.decomposition import PCA
from mpl_toolkits.mplot3d import Axes3D
from PIL import Image

from pymks import (
    generate_multiphase,
    plot_microstructures,
    PrimitiveTransformer,
    TwoPointCorrelation,
    FlattenTransformer
)
```

```
[2]: from sklearn.decomposition import PCA
#PYTEST_VALIDATE_IGNORE_OUTPUT

# %matplotlib inline
%load_ext autoreload
%autoreload 2
```

# molecular strings and fingerprints

