CA²M: A Compact Algorithm to Generate and Measure Nanoscopic Aggregates
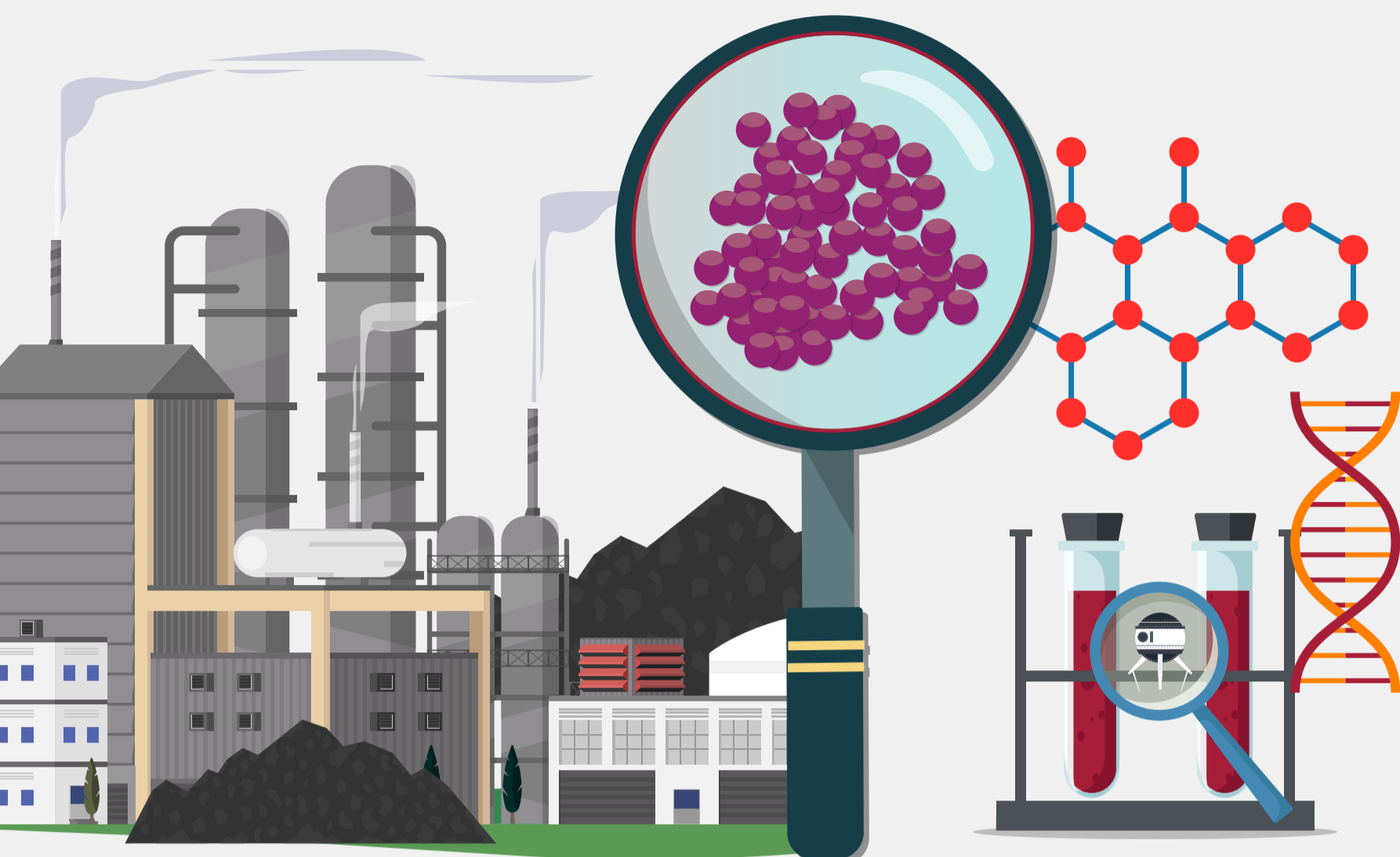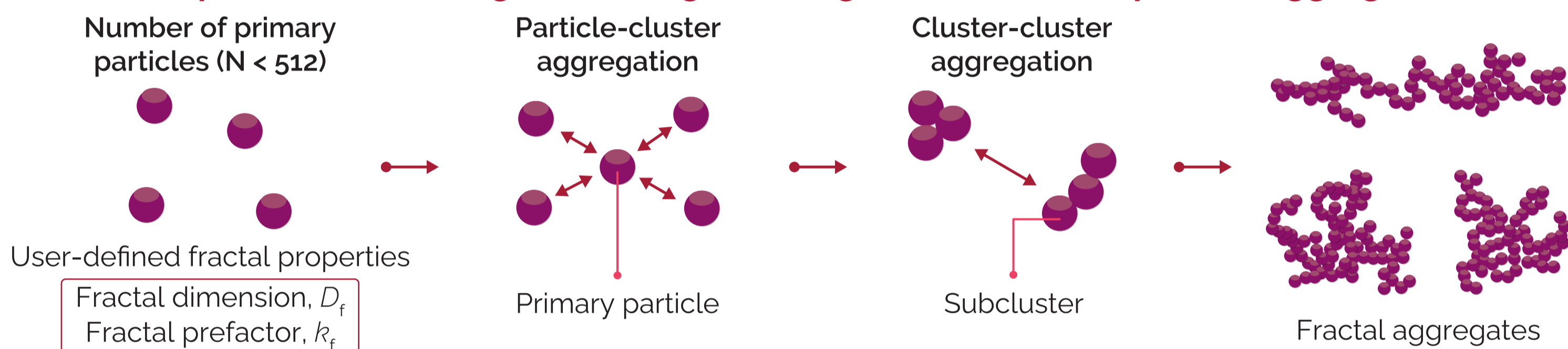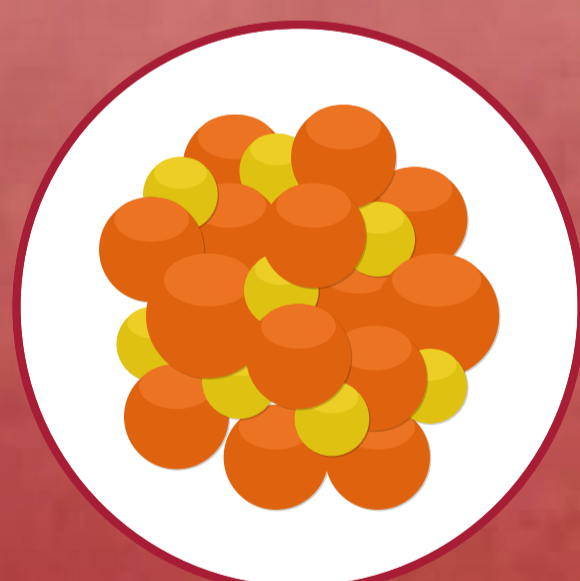
The structure of nanoparticle aggregates and agglomerates formed of solid primary particles is relevant to a variety of fields, including soot formation and engineered nanoparticles

However, a simple and versatile tool for the estimation and comparison of aerosol properties is lacking

A sequential tunable algorithm for generating fractal-like nanoparticle aggregates

Number of primary particles (N < 512)

Particle-cluster aggregation

Cluster-cluster aggregation

User-defined fractal properties

Fractal dimension, D_f
Fractal prefactor, k_f

Primary particle

Subcluster

Fractal aggregates

Fast and computationally efficient algorithm

Generates a broad range of aggregate shapes and sizes
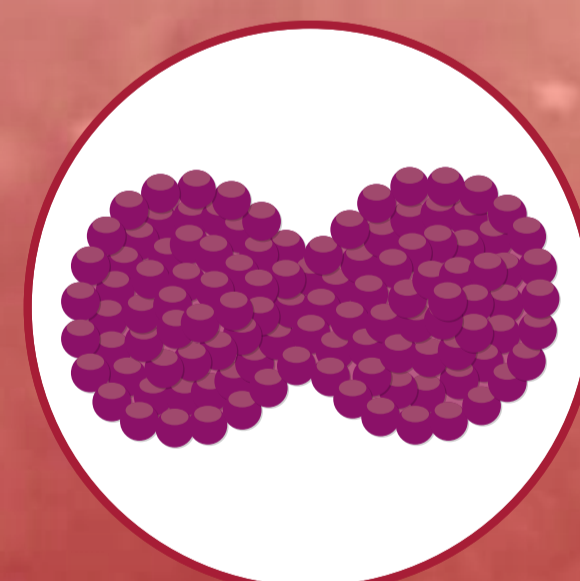
Considers non-idealities in aggregate formation

The proposed algorithm can help generate and measure fractal-like aggregates for a wide range of morphologies at reasonable computational costs

Download the model at https://github.com/cjourdain03/CA2M.git

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