

Image Projection Methods

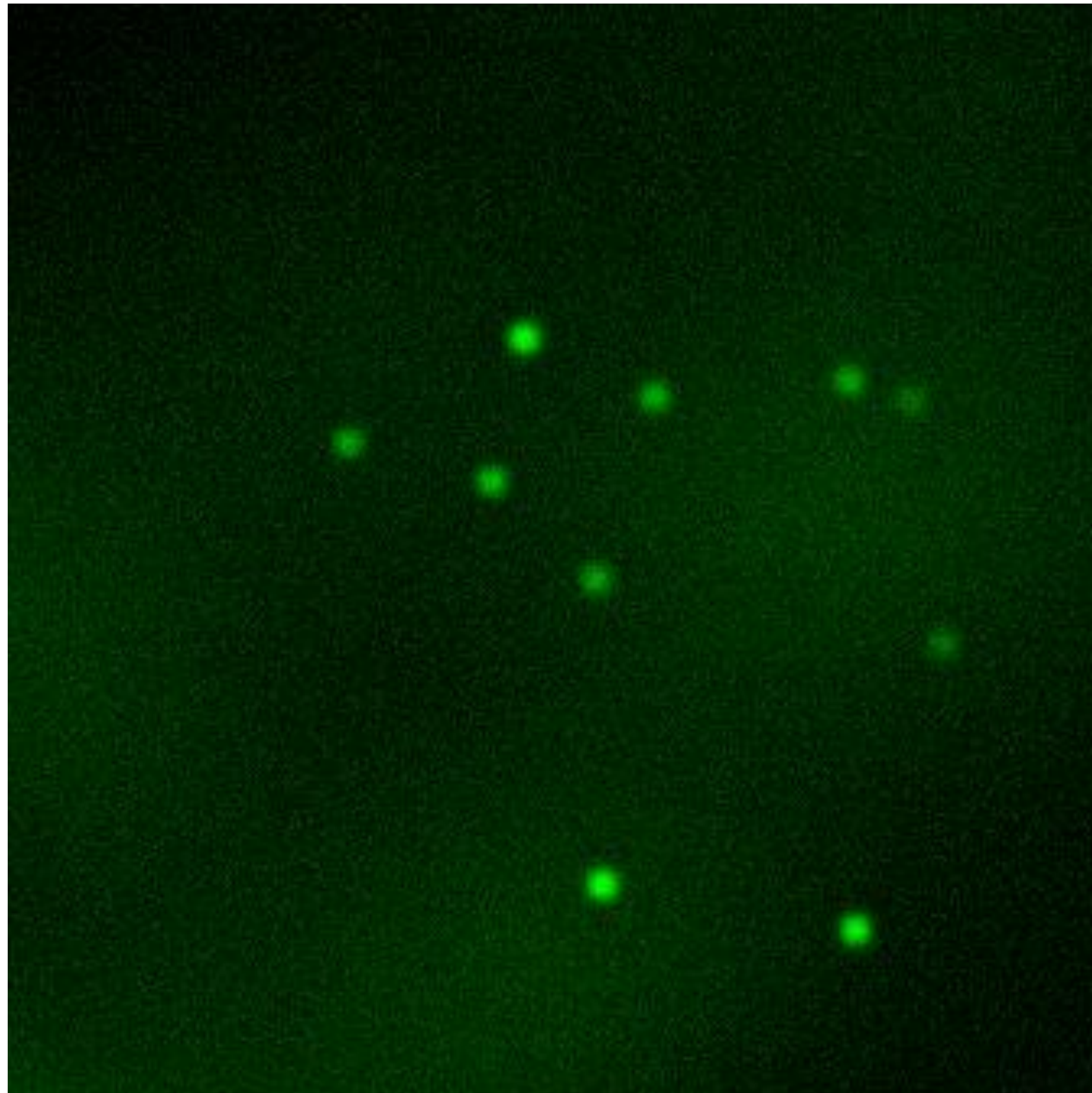
Image Processing & Analysis for Life Scientists

Olivier Burri, Romain Guiet & Arne Seitz

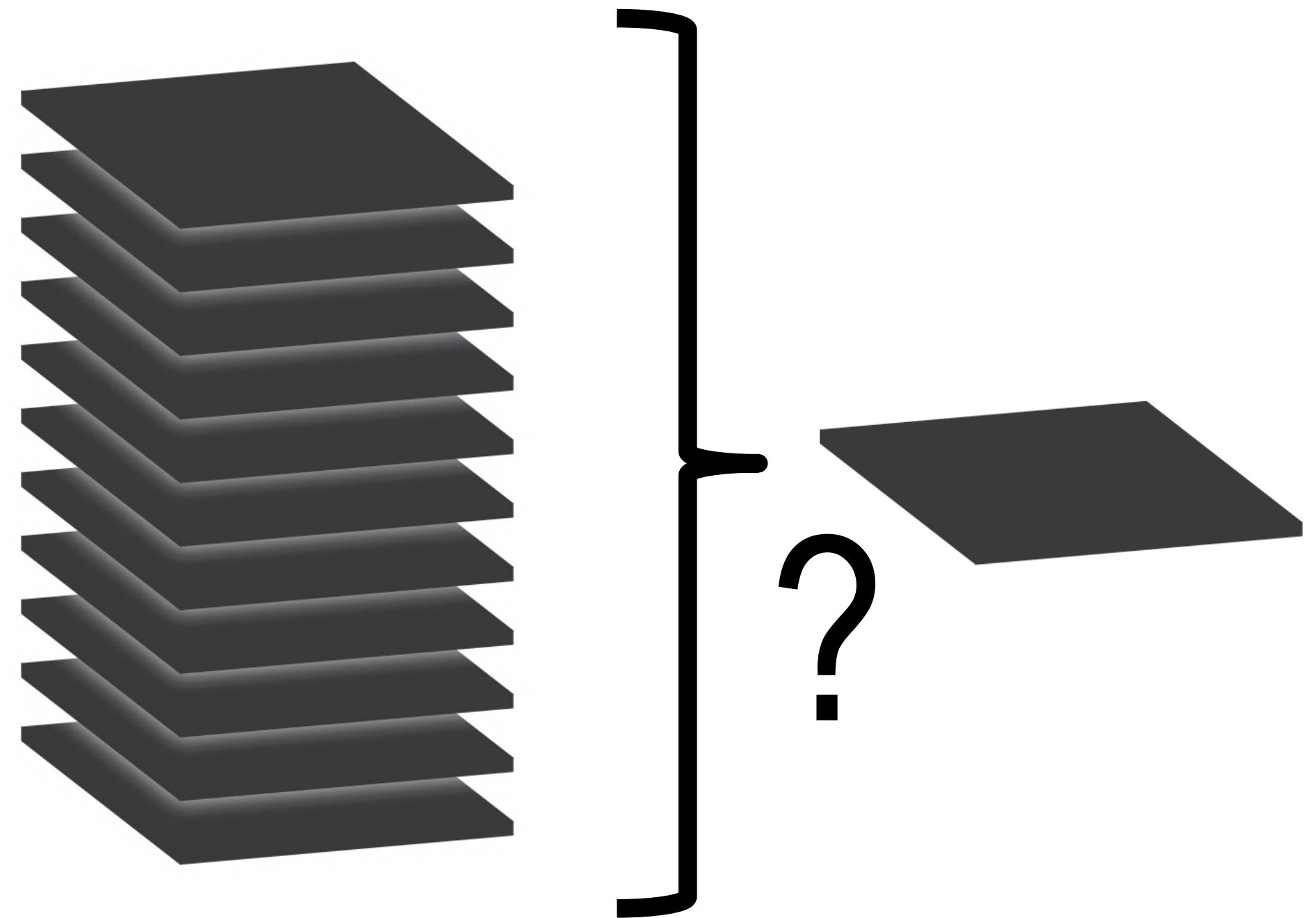
Image Projection Methods

- Definition
- Simple Projections
- Color-Coded Projections

Projections: Approach

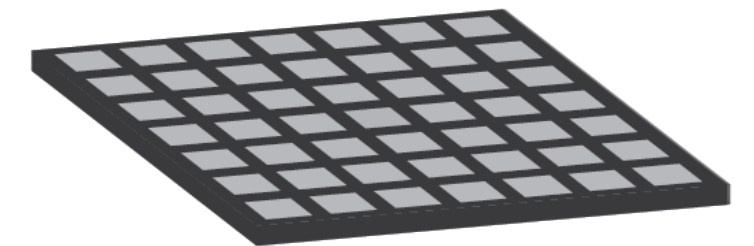


Dimensionality Reduction



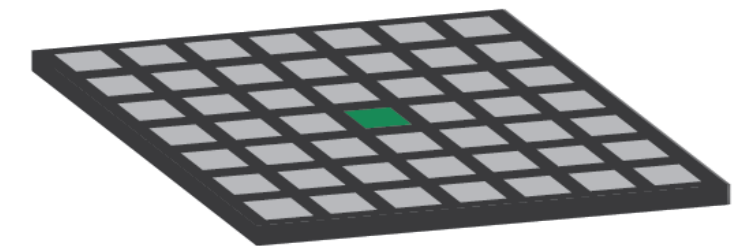
Projections: Approach

Dimensionality Reduction



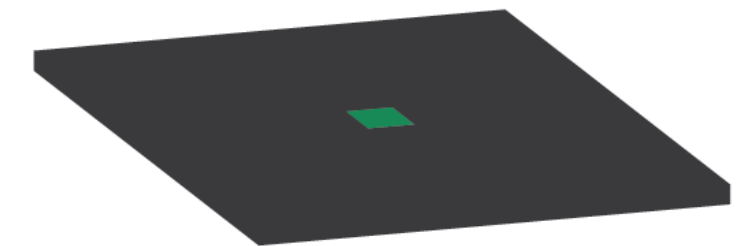
Projections: Approach

Dimensionality Reduction



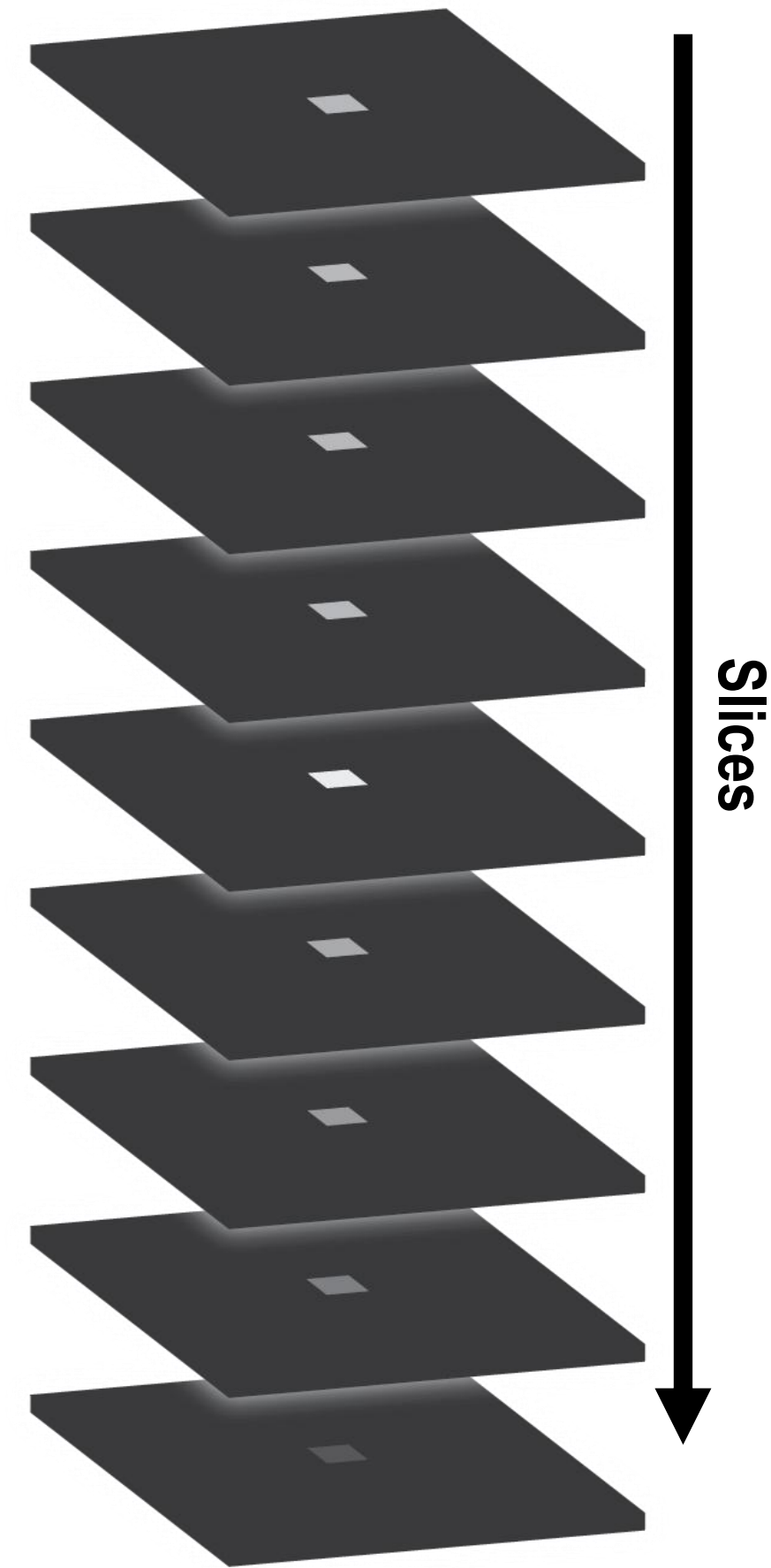
Projections: Approach

Dimensionality Reduction



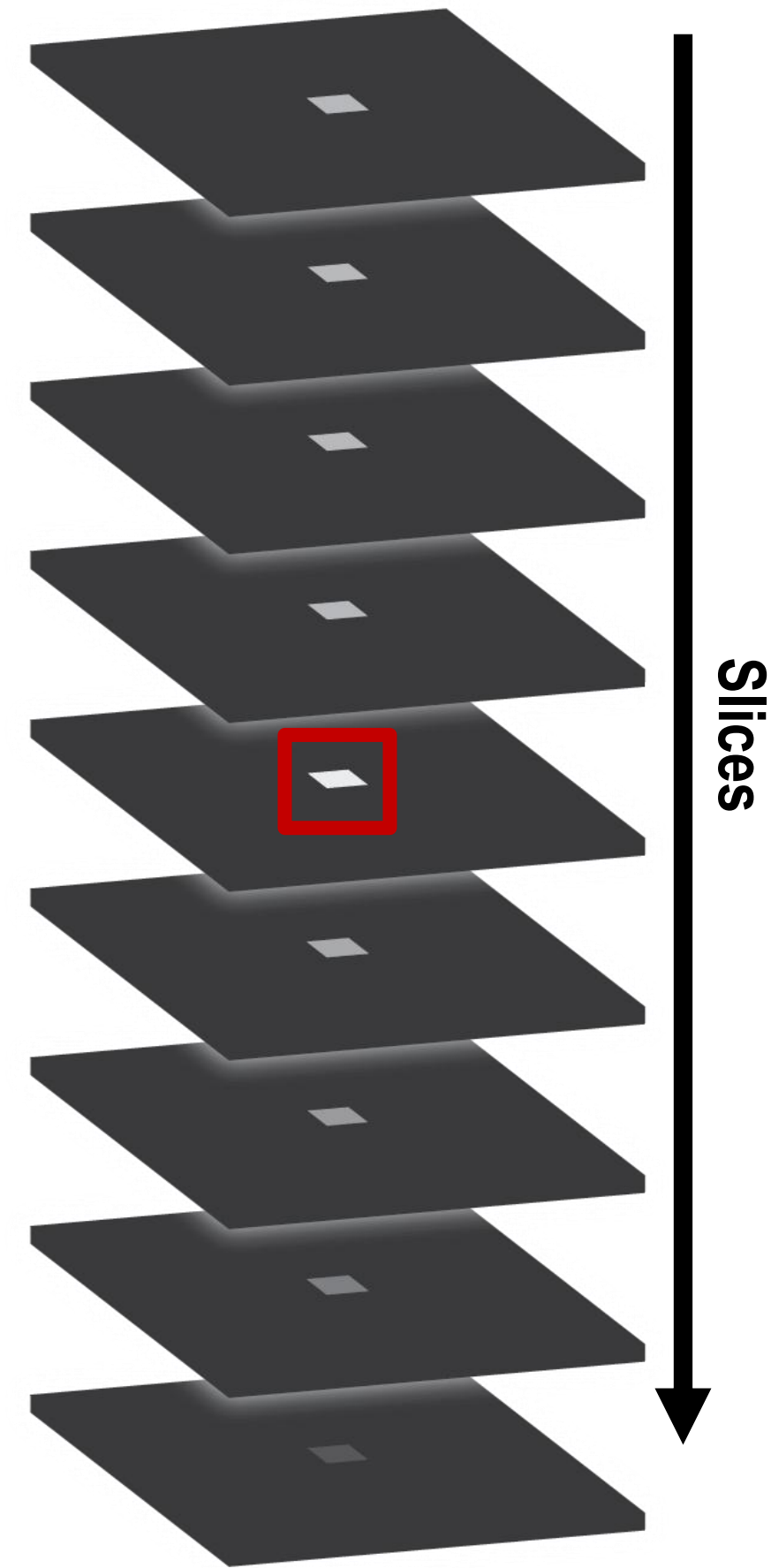
Projections: Approach

Dimensionality Reduction



Projections: Approach

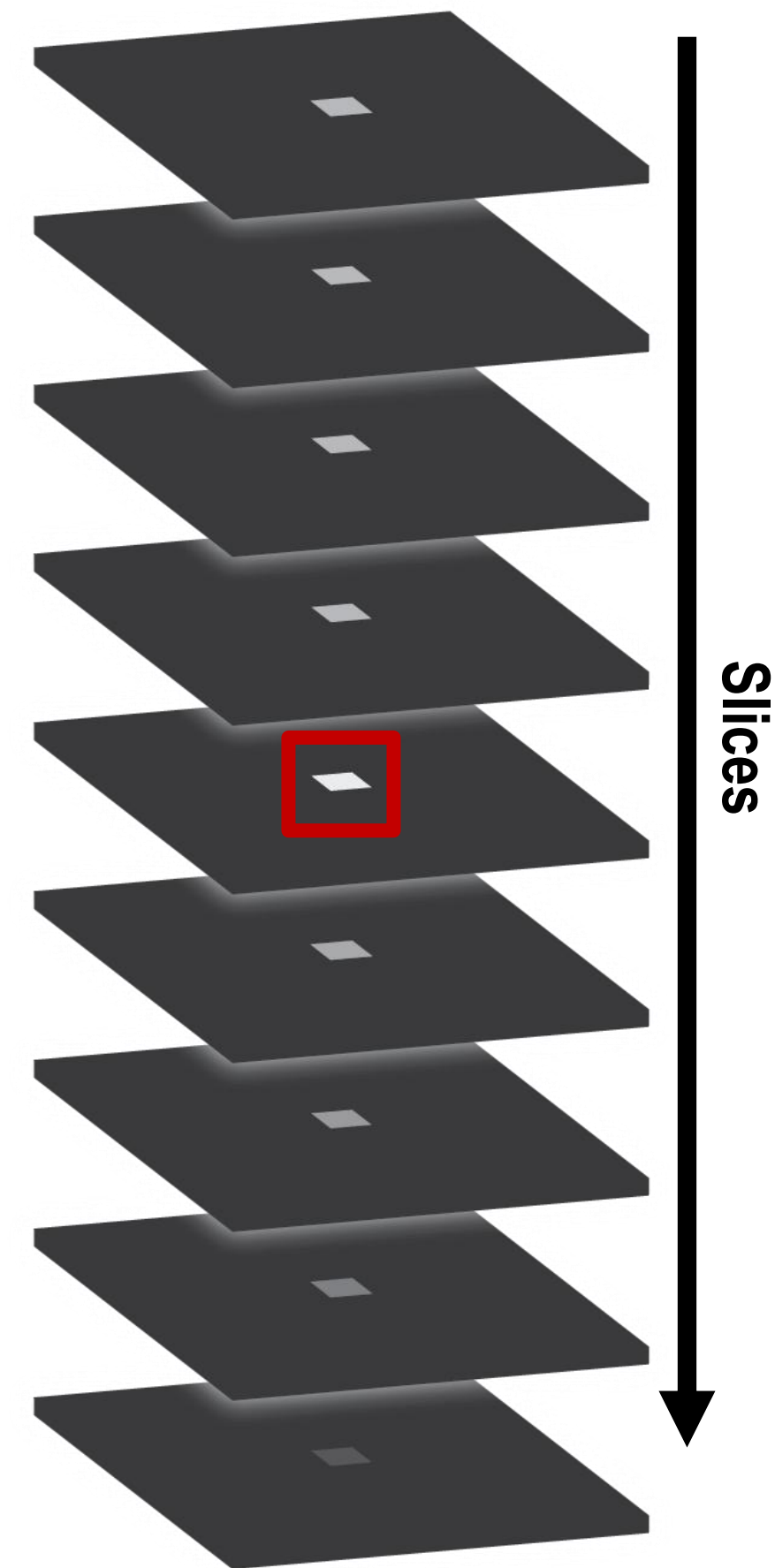
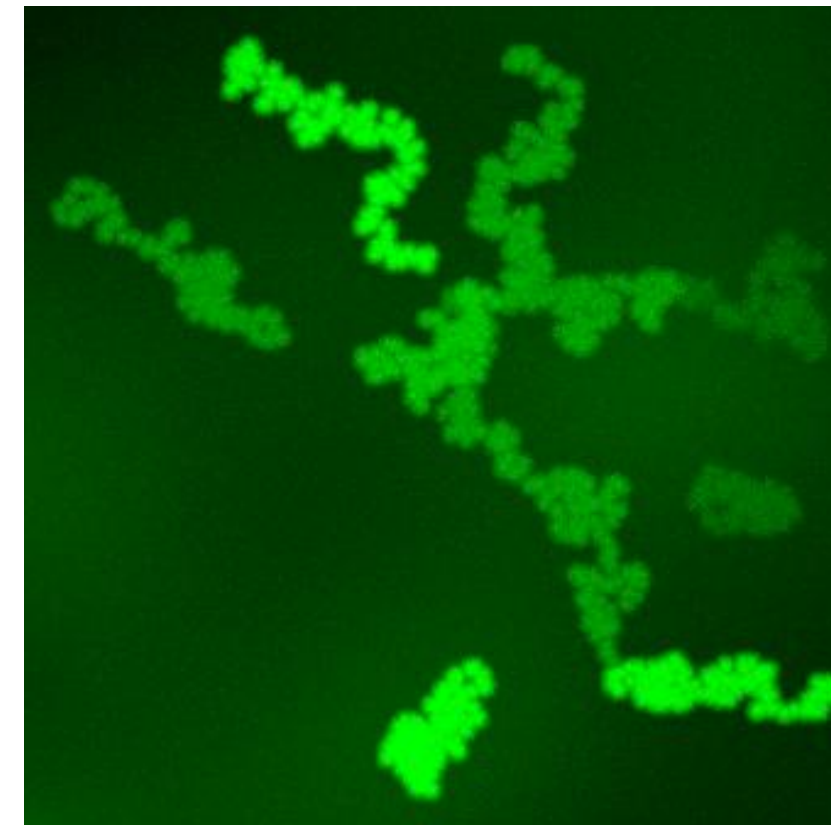
Dimensionality Reduction



Projections: Approach

Dimensionality Reduction

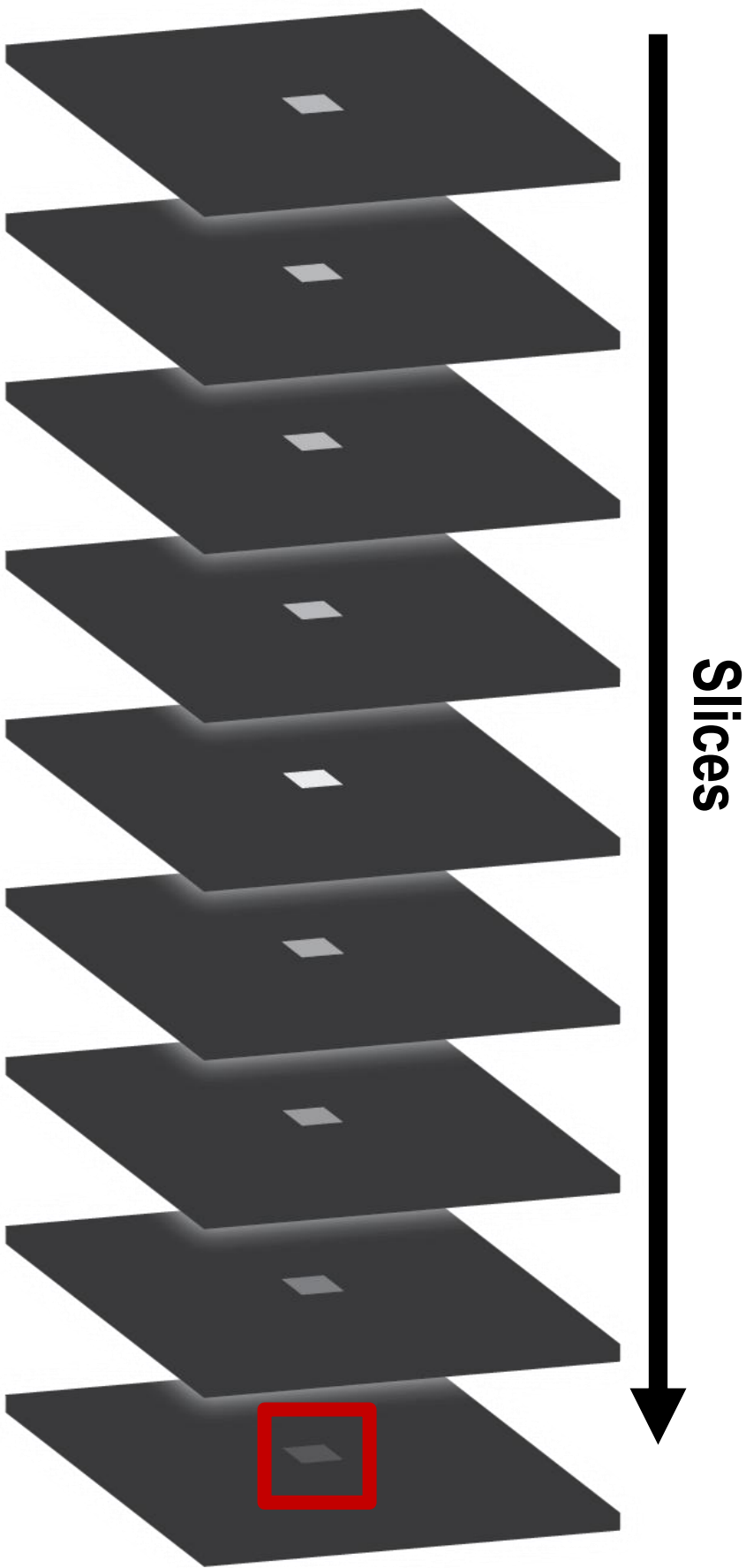
Max Intensity Projection (MIP)



Projections: Approach

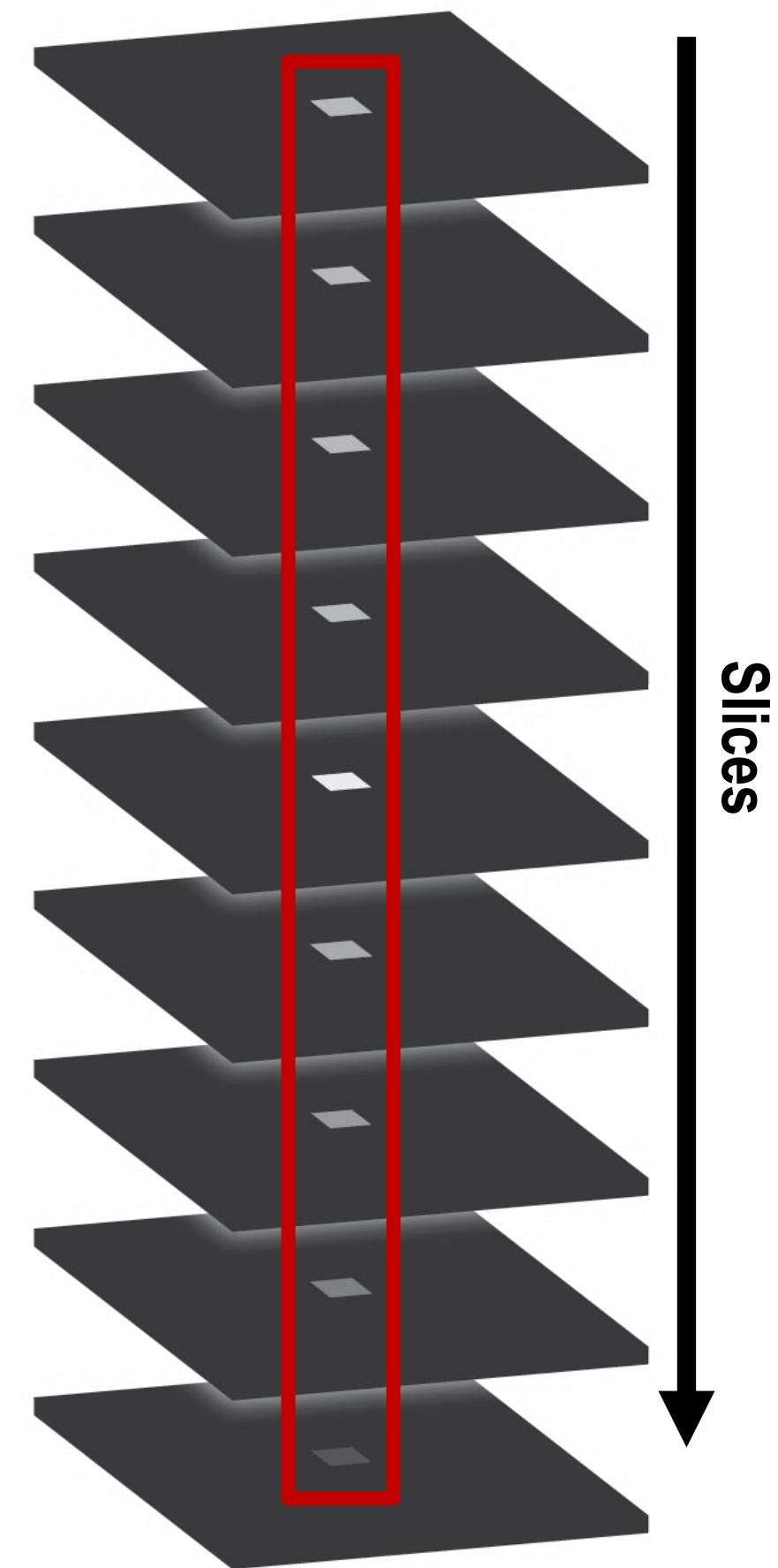
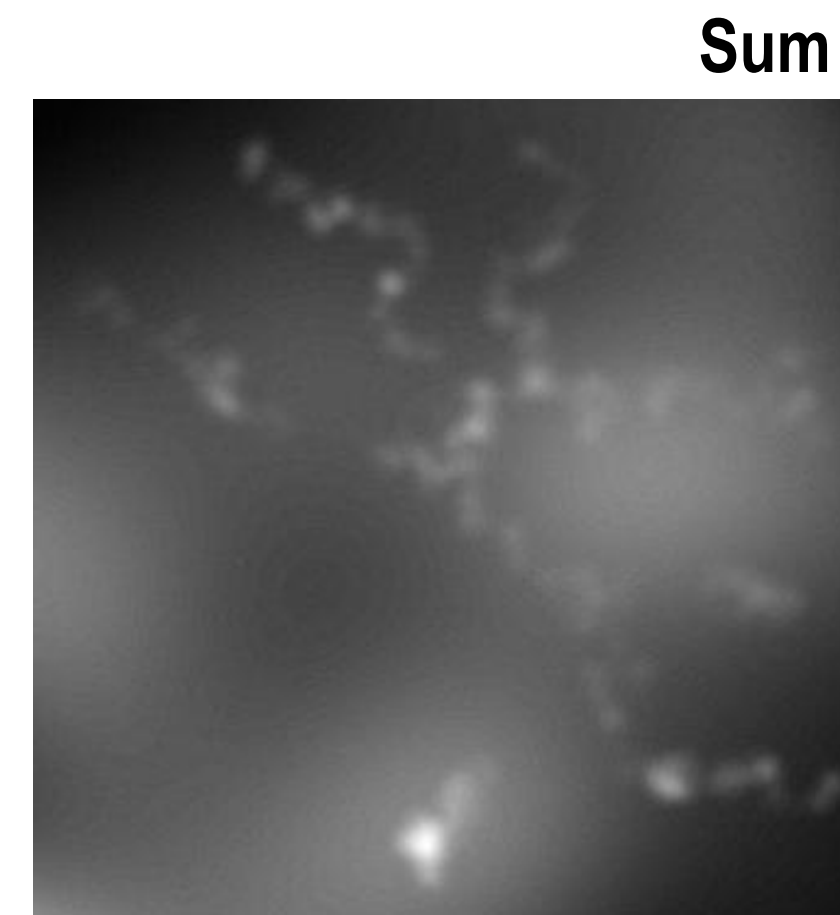
Dimensionality Reduction

Min Intensity Projection



Projections: Approach

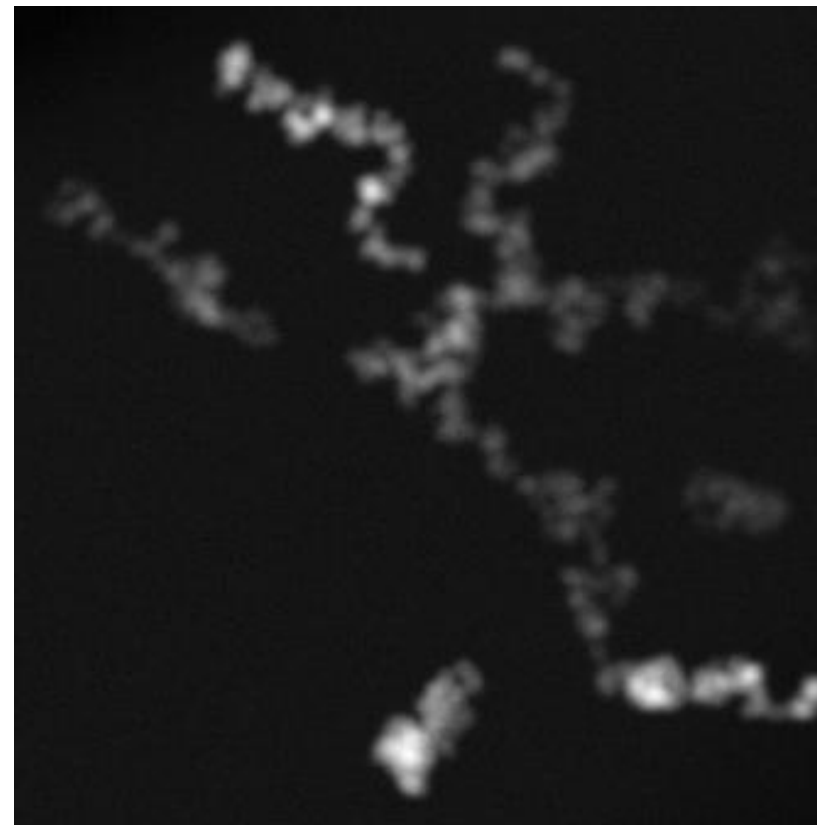
Dimensionality Reduction



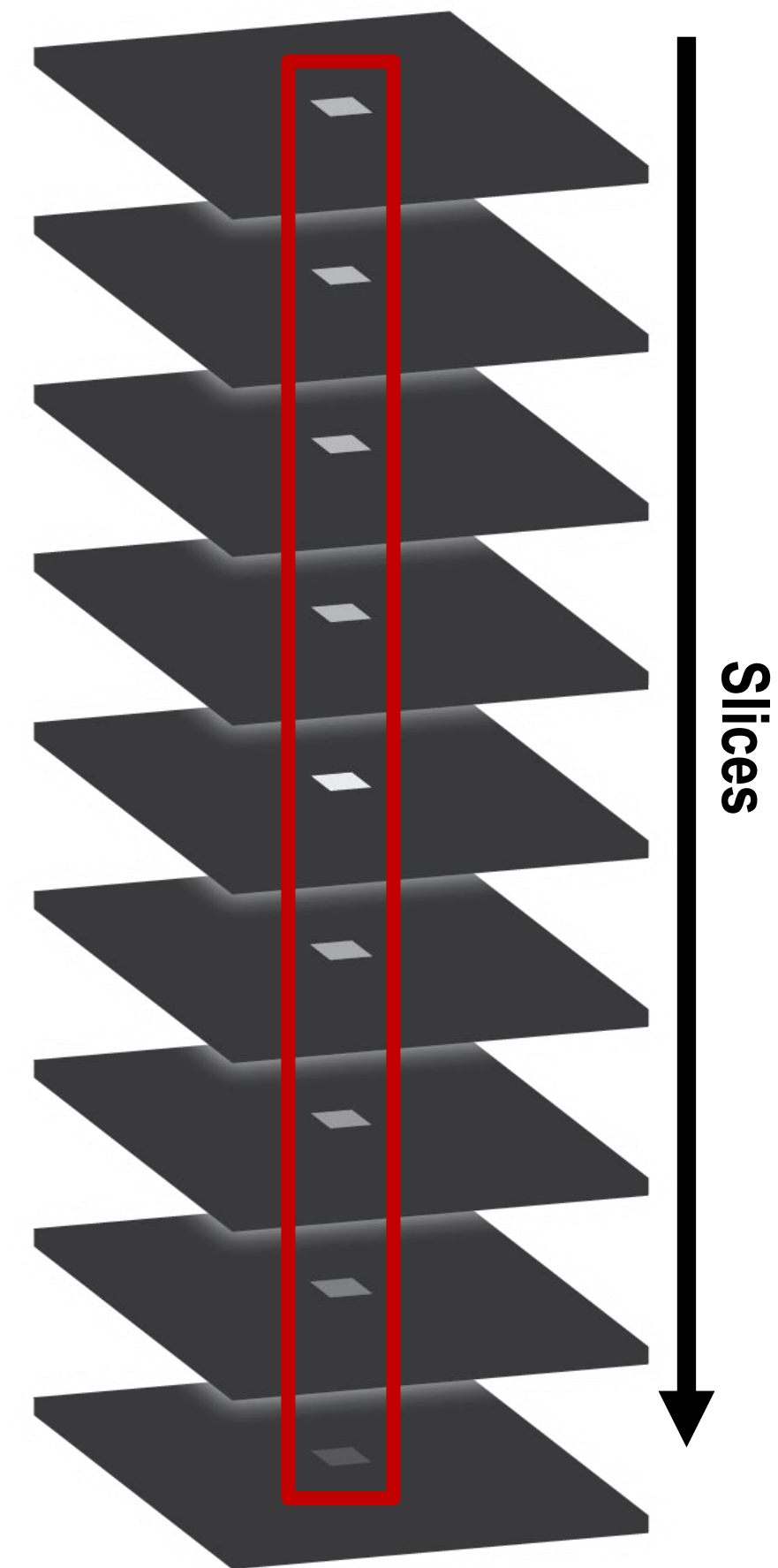
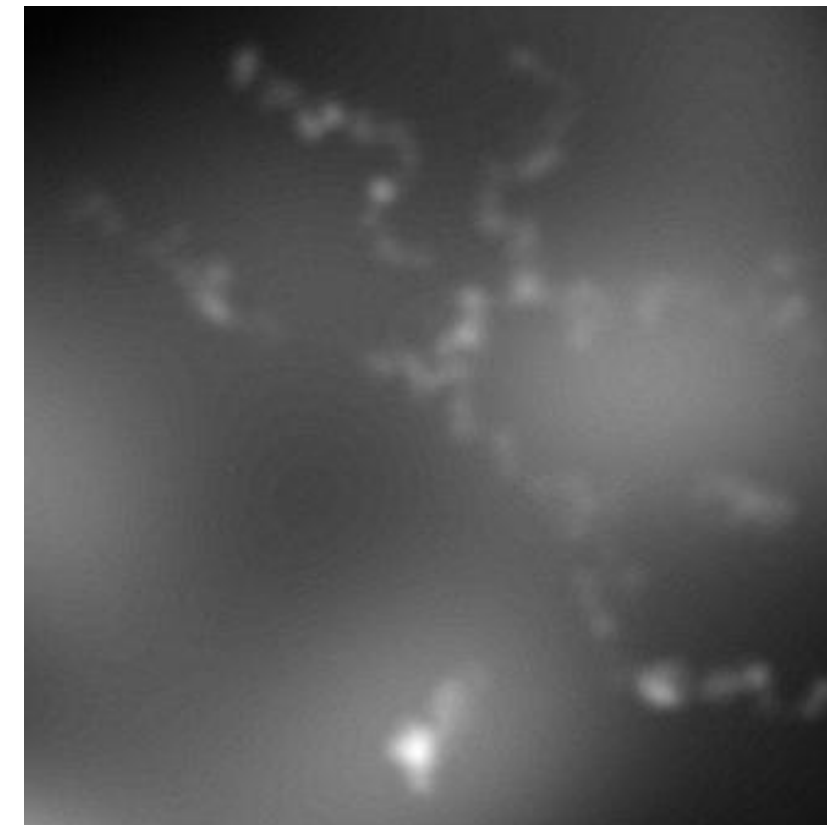
Projections: Approach

Dimensionality Reduction

Standard Deviation



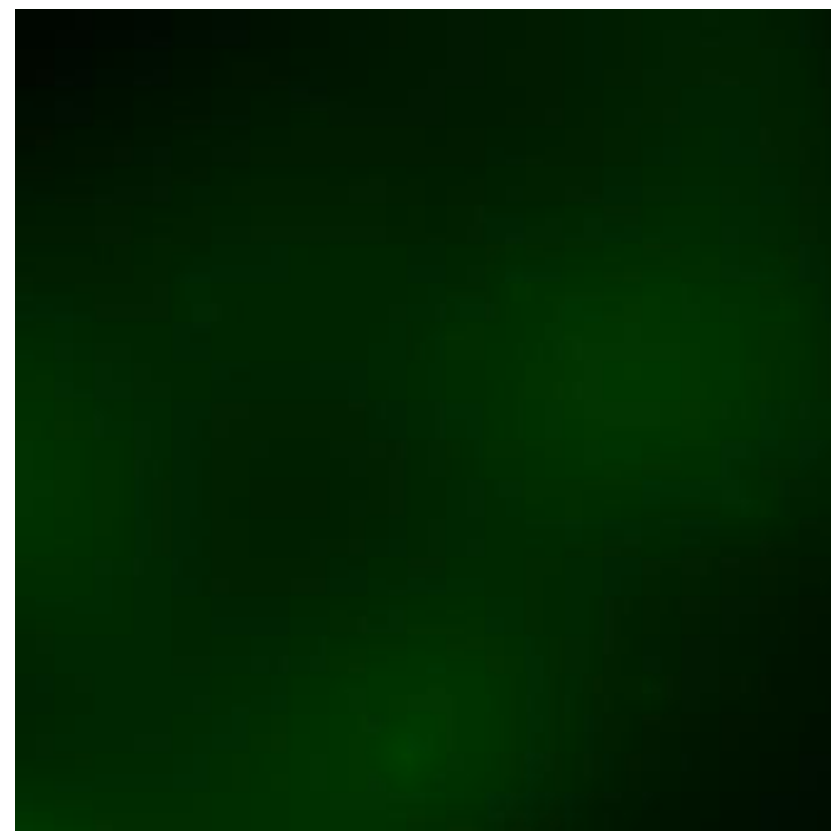
Sum



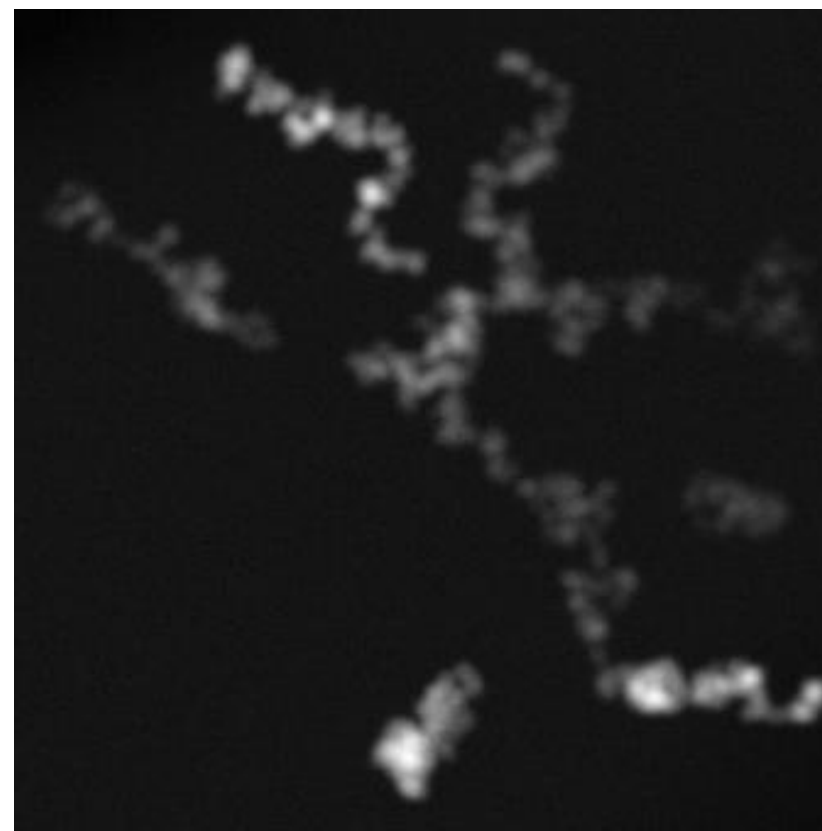
Projections: Approach

Dimensionality Reduction

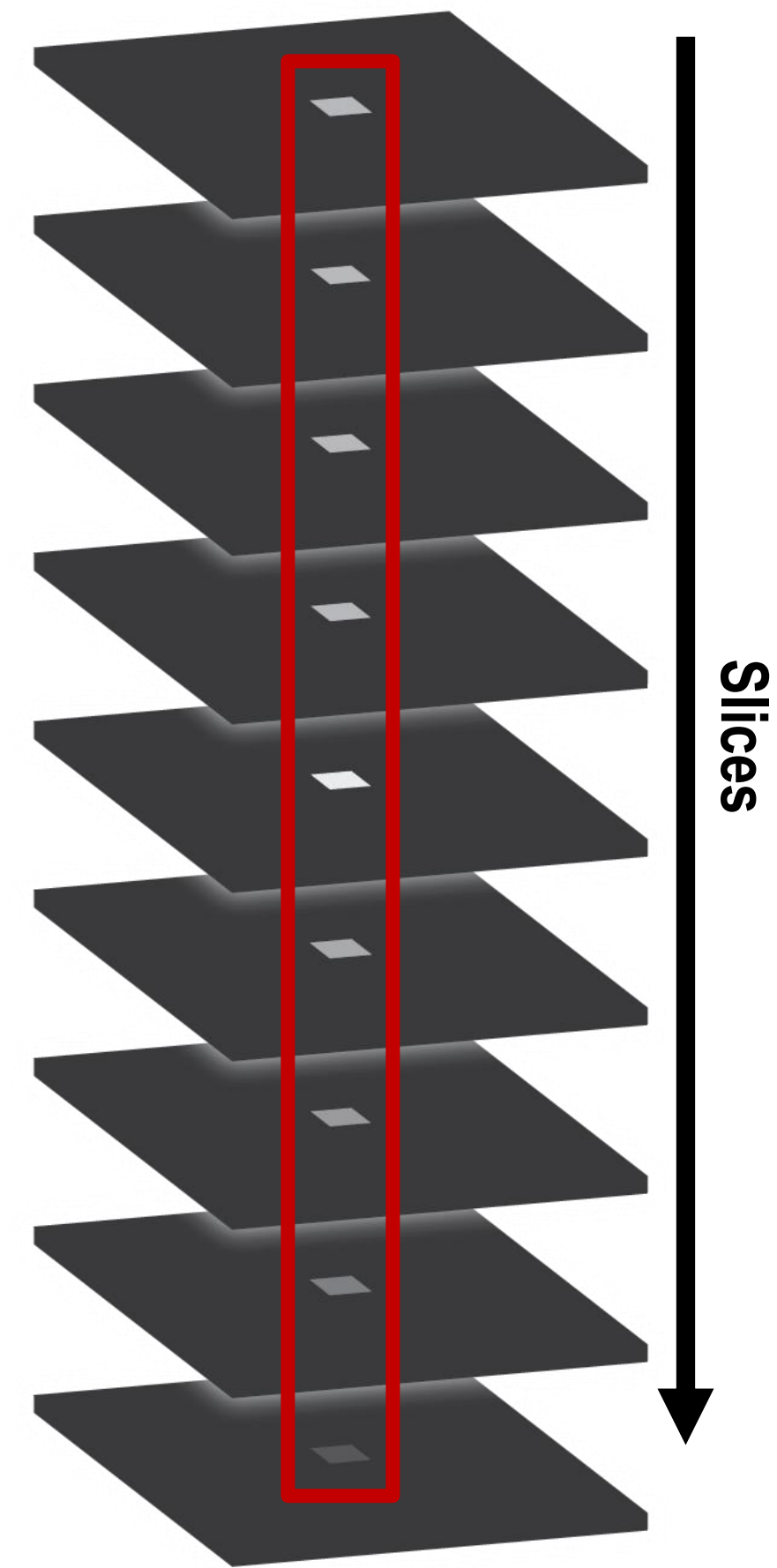
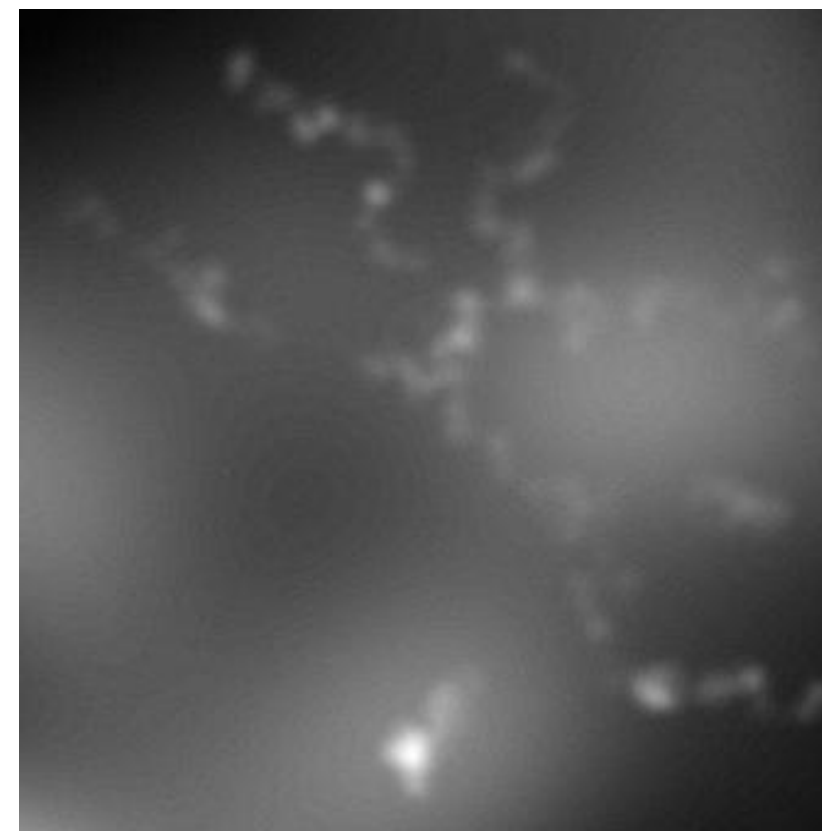
Median



Standard Deviation



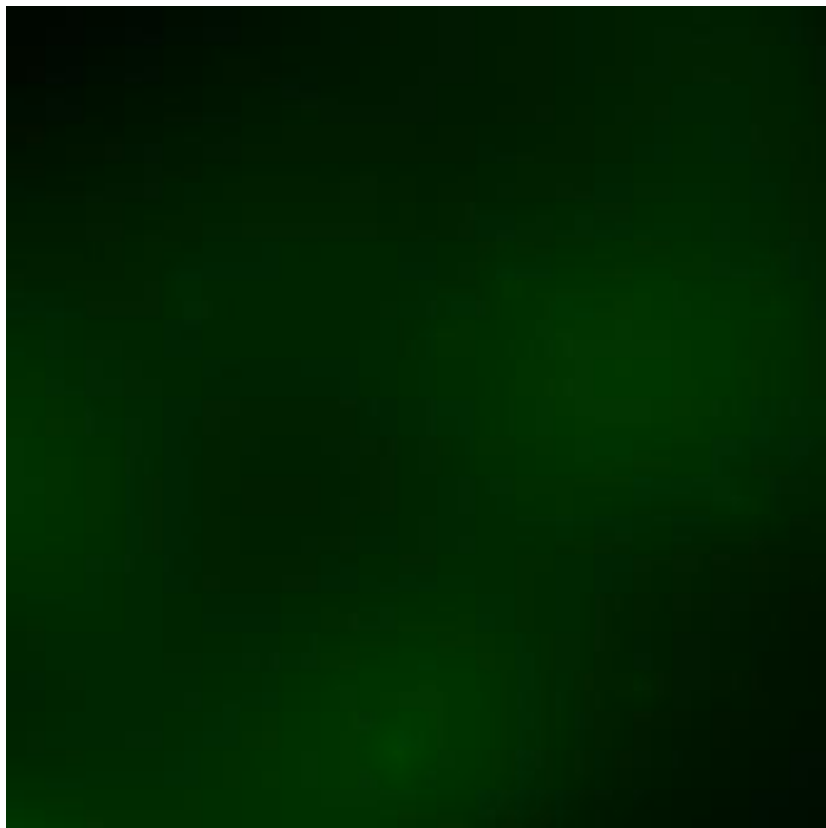
Sum



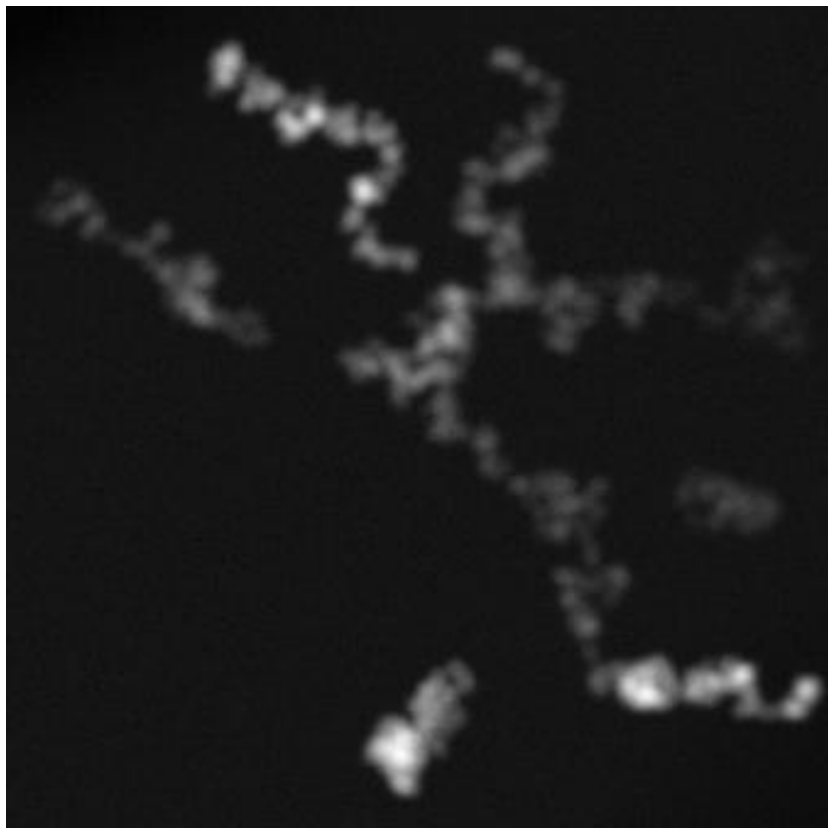
Projections: Approach

Dimensionality Reduction

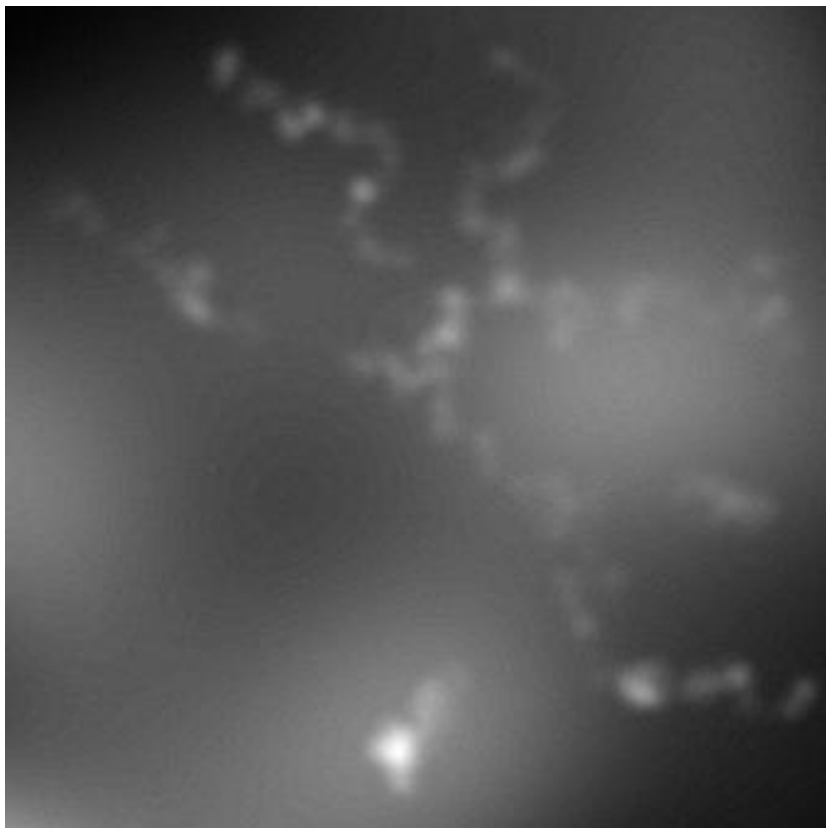
Median



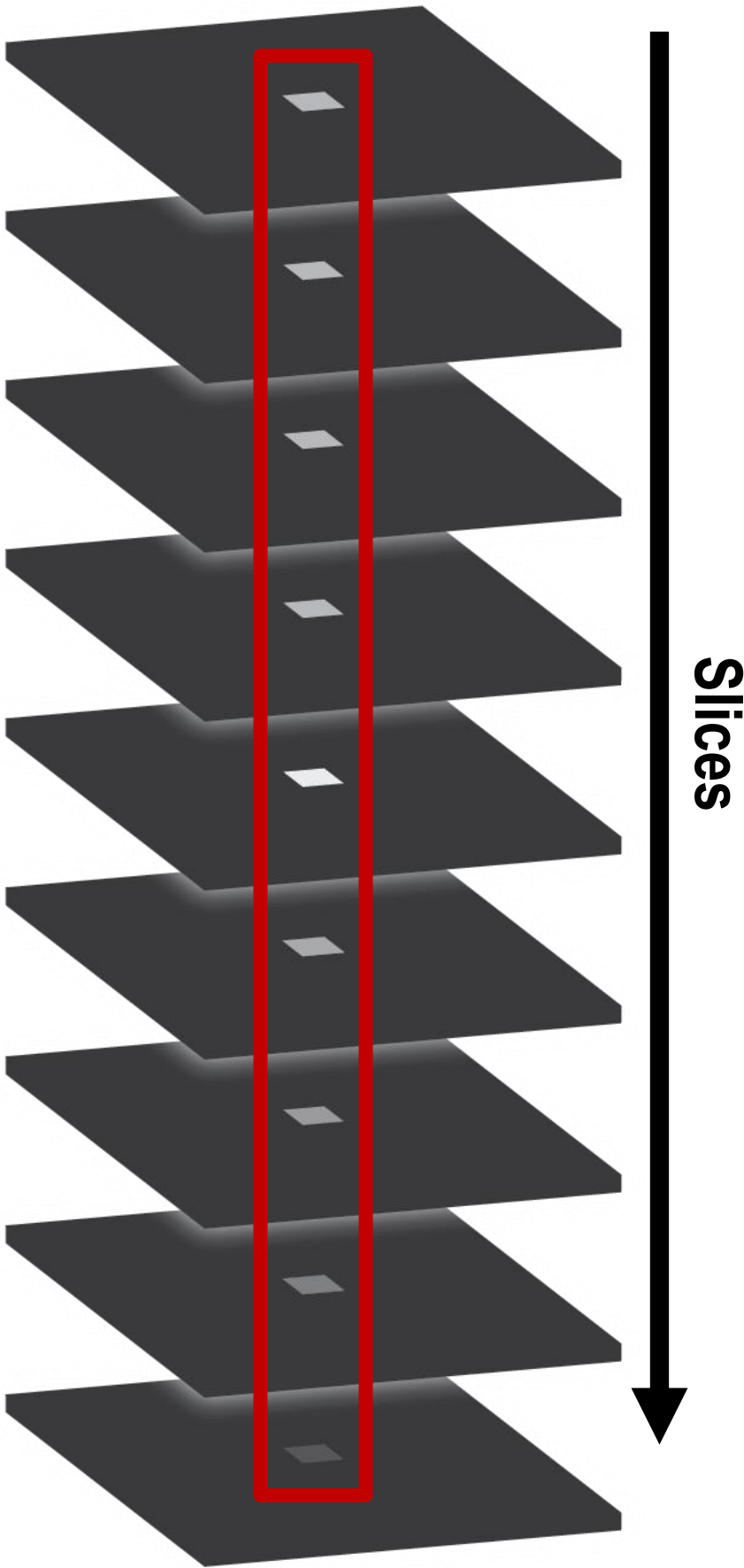
Standard Deviation



Sum

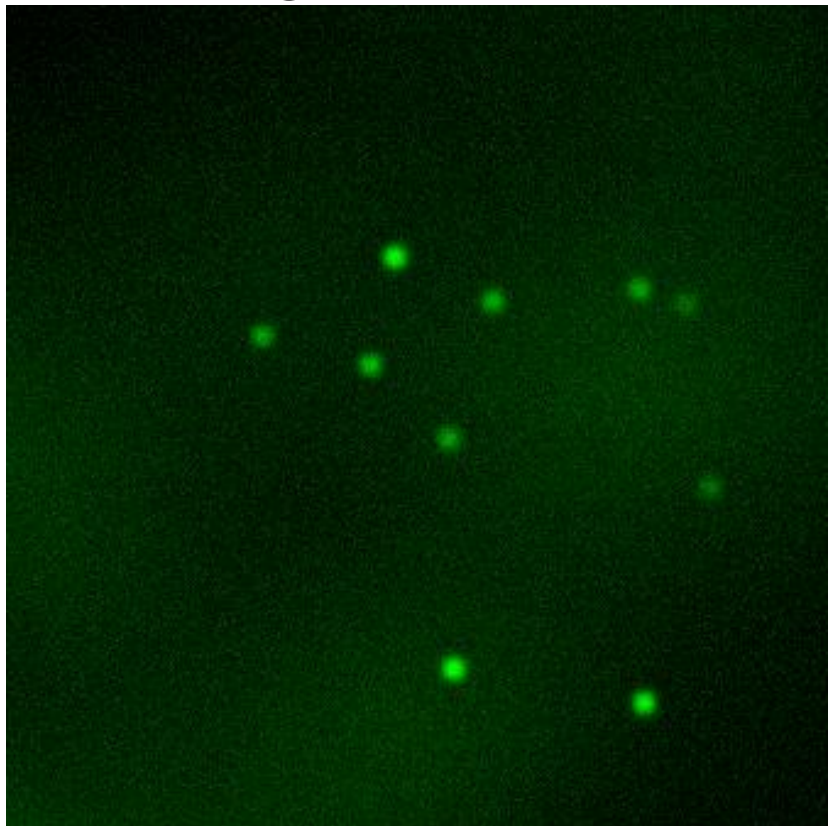


1x1x9 3D Filters



Projections

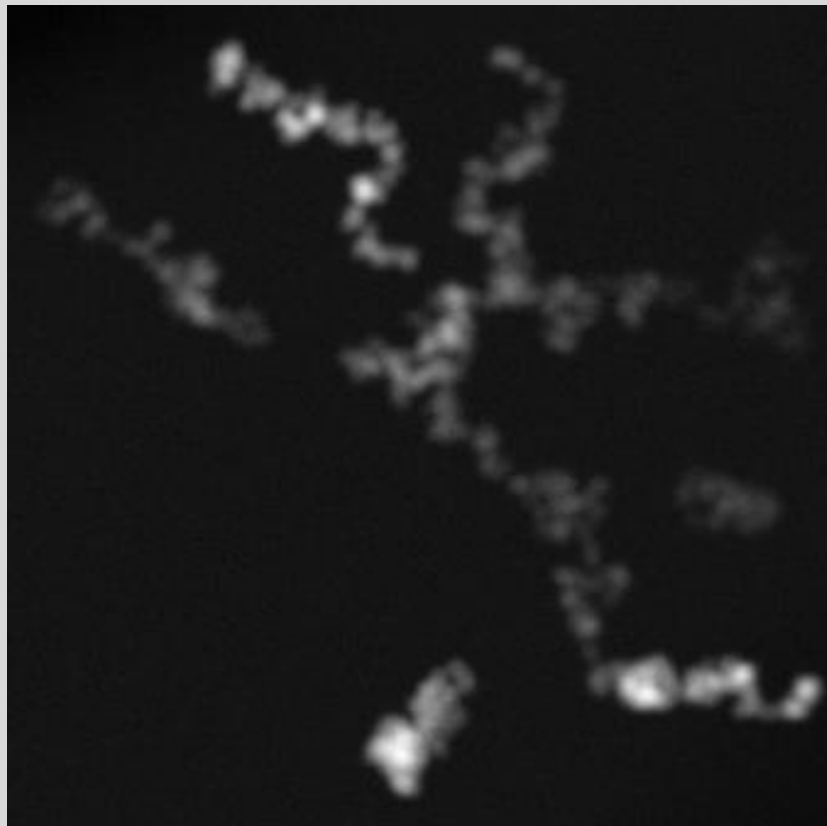
Original Data



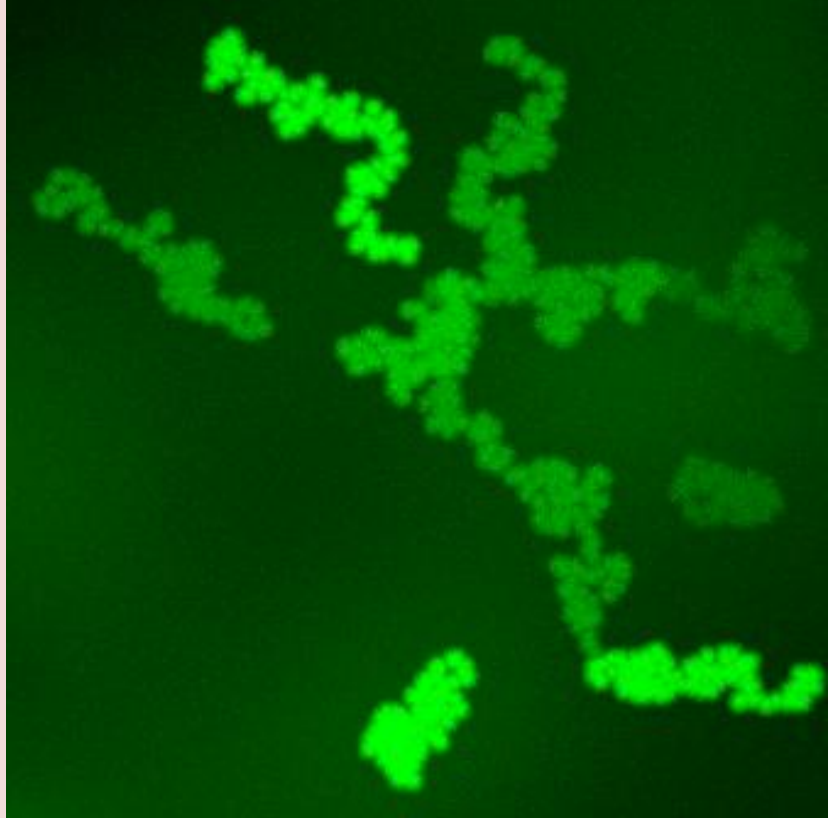
Minimum



Standard Deviation



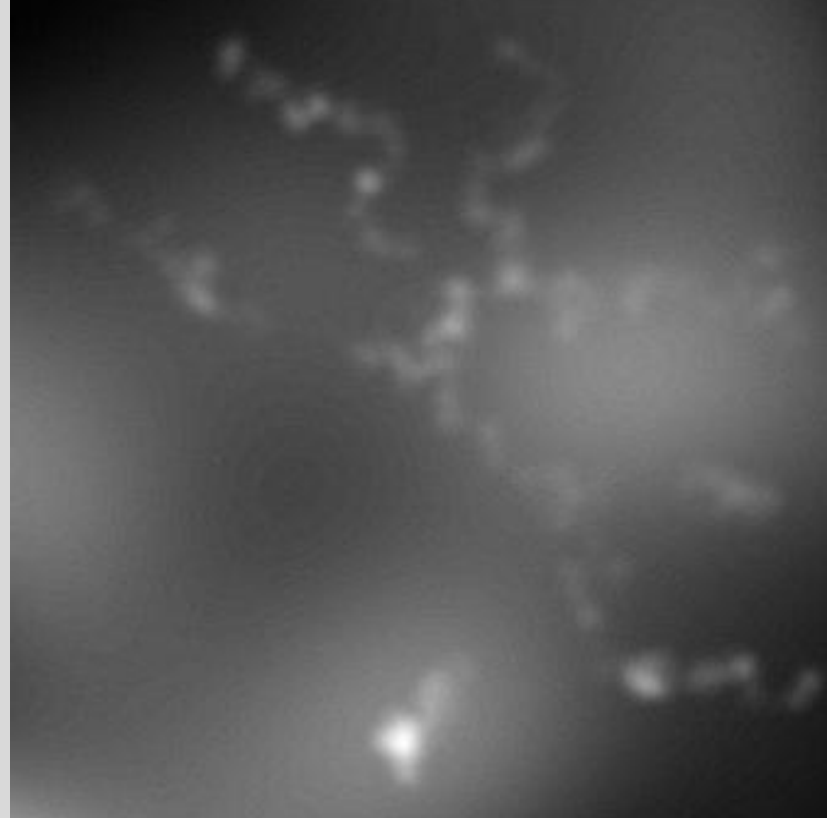
Maximum



Median



Sum



Original Bit Depth

32-Bit Depth



Image > Stacks >
Z Project

Projections

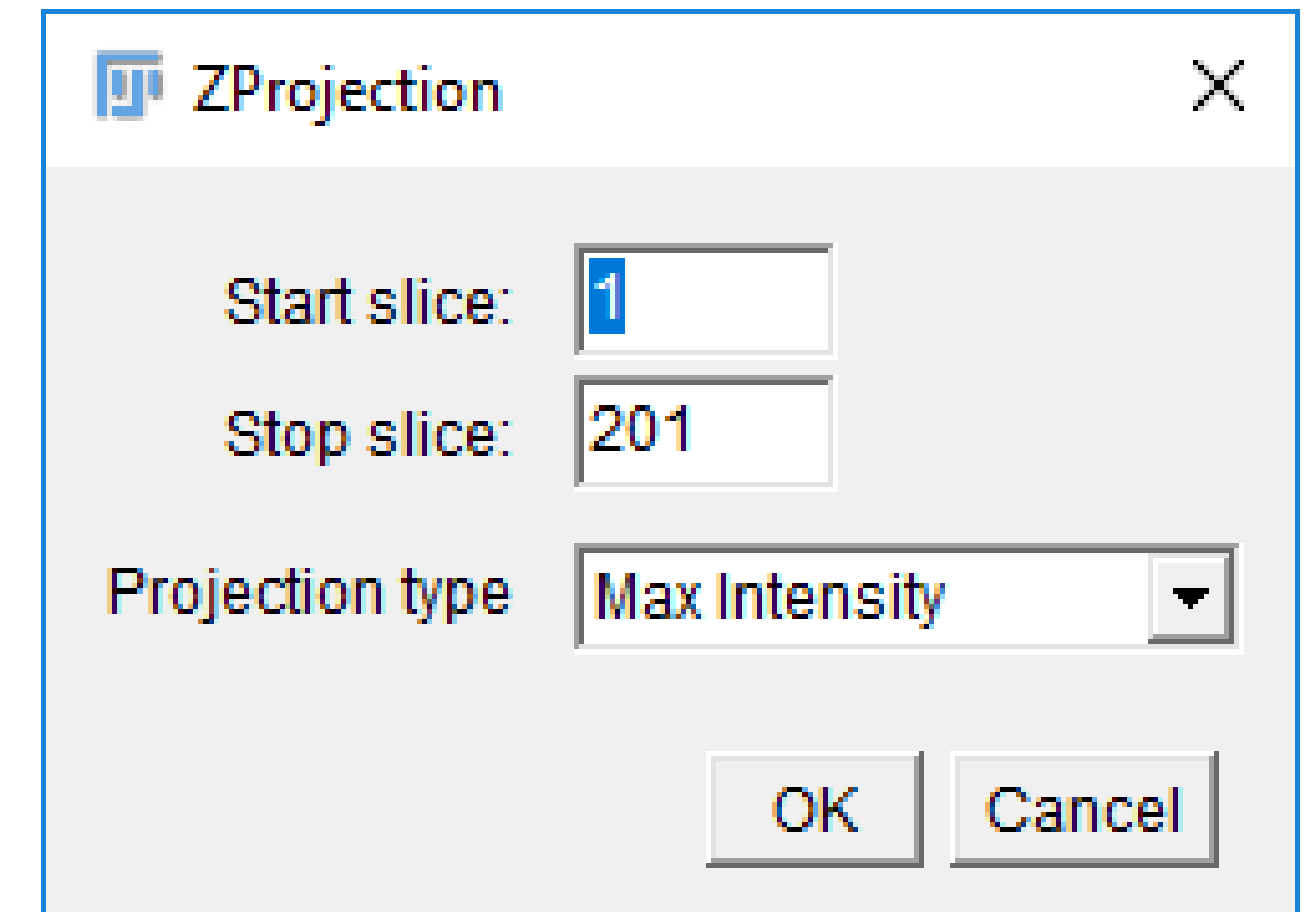


Image > Stacks >
Z Project

Projections

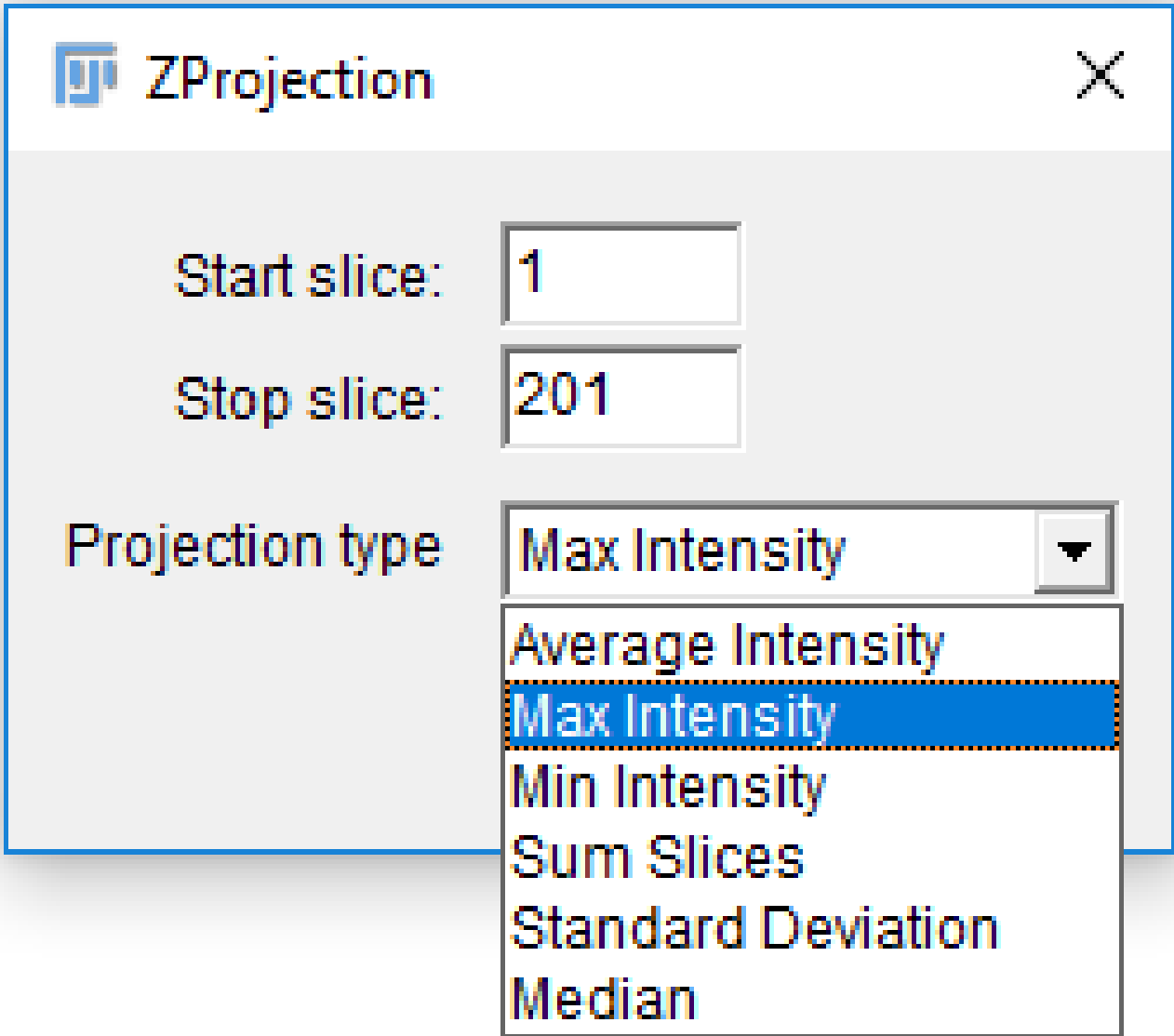
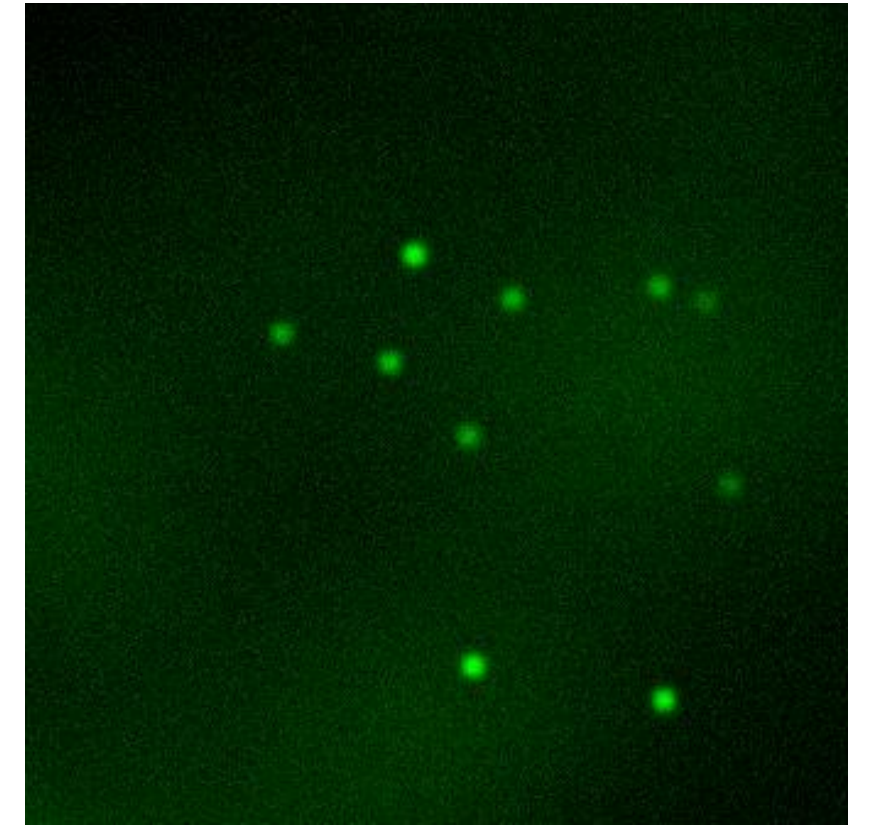
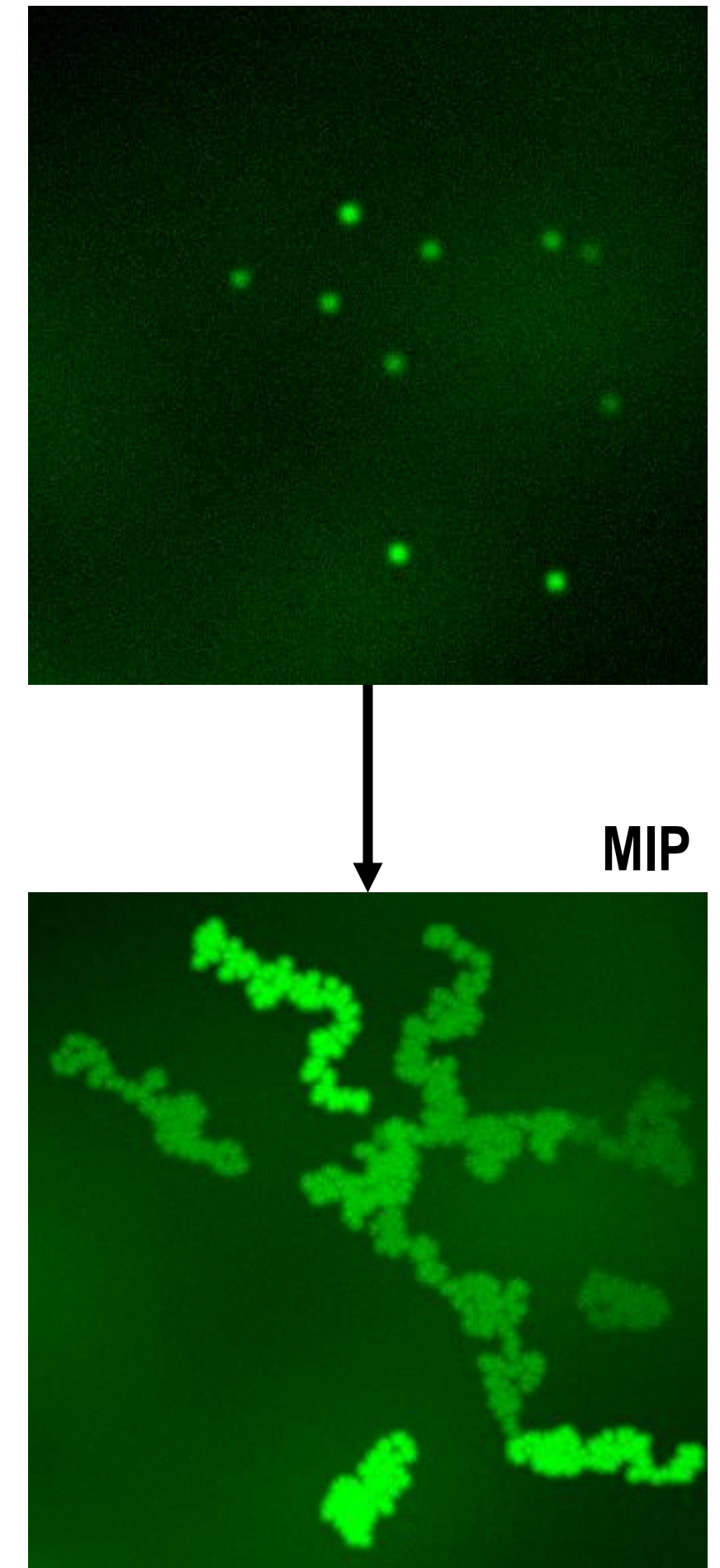


Image > Stacks >
Z Project

Application: Background Estimation

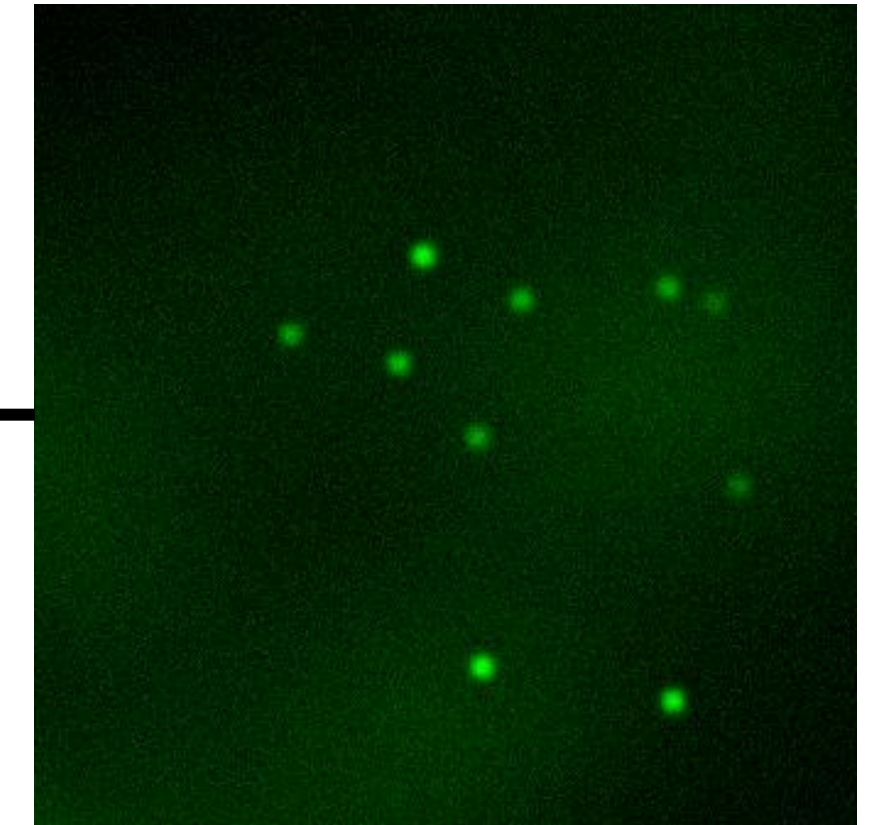
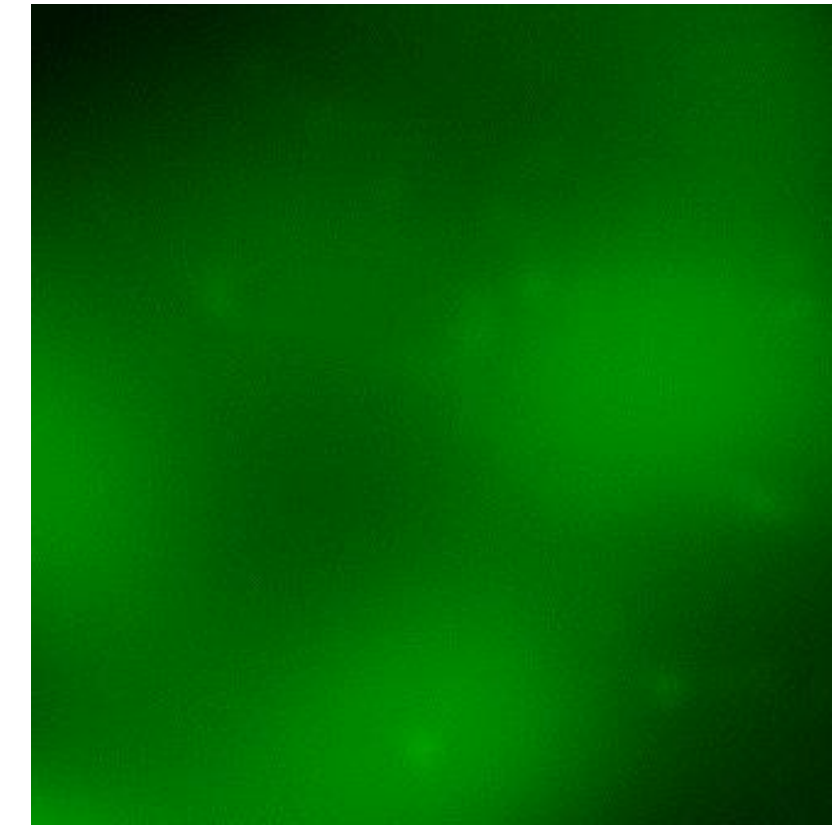


Application: Background Estimation

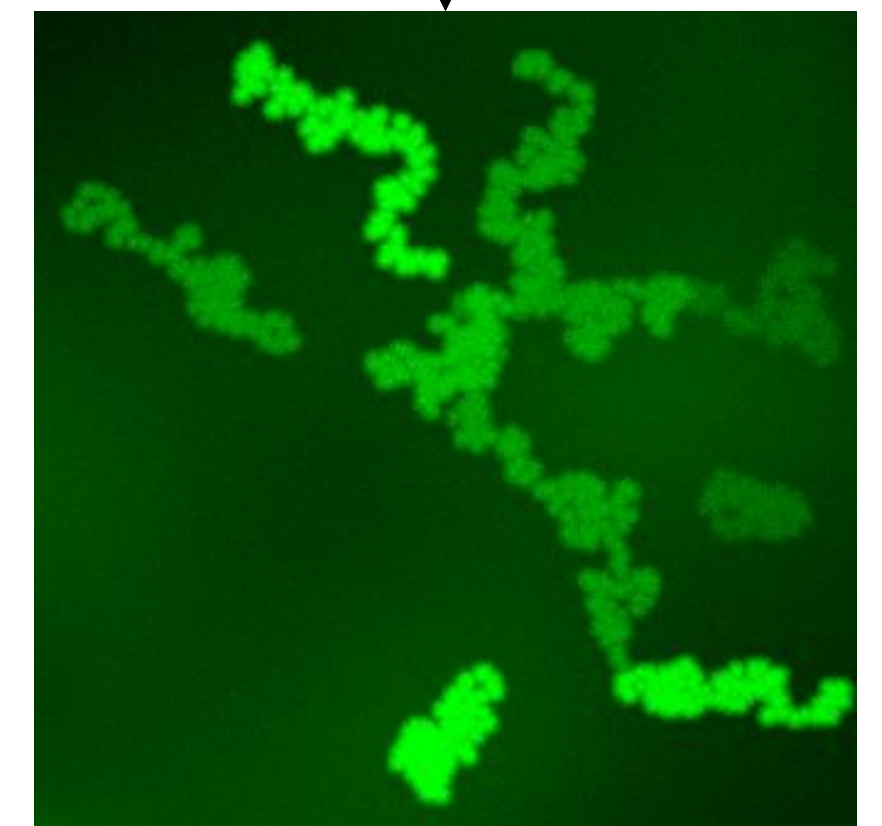


Application: Background Estimation

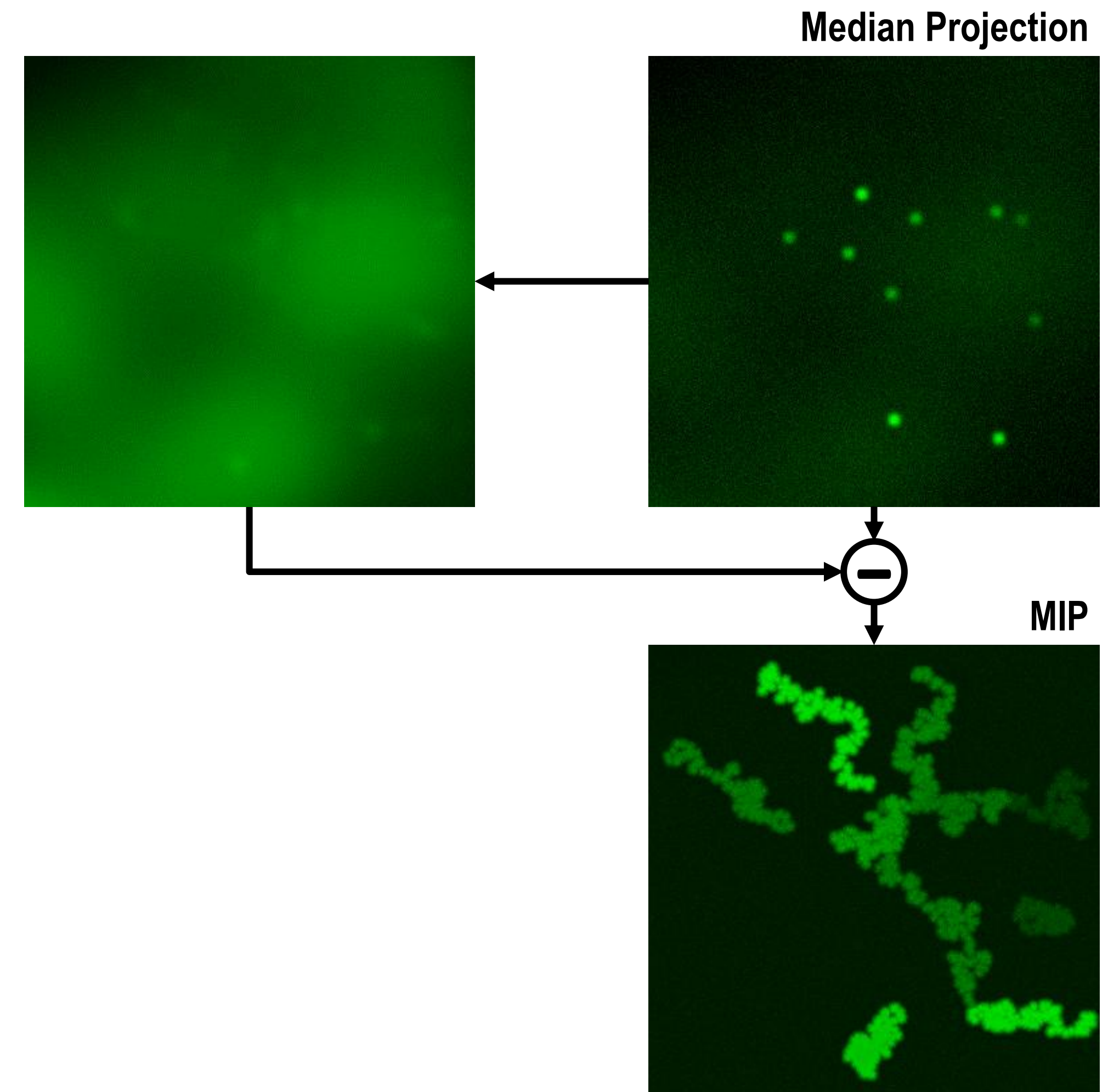
Median Projection



MIP

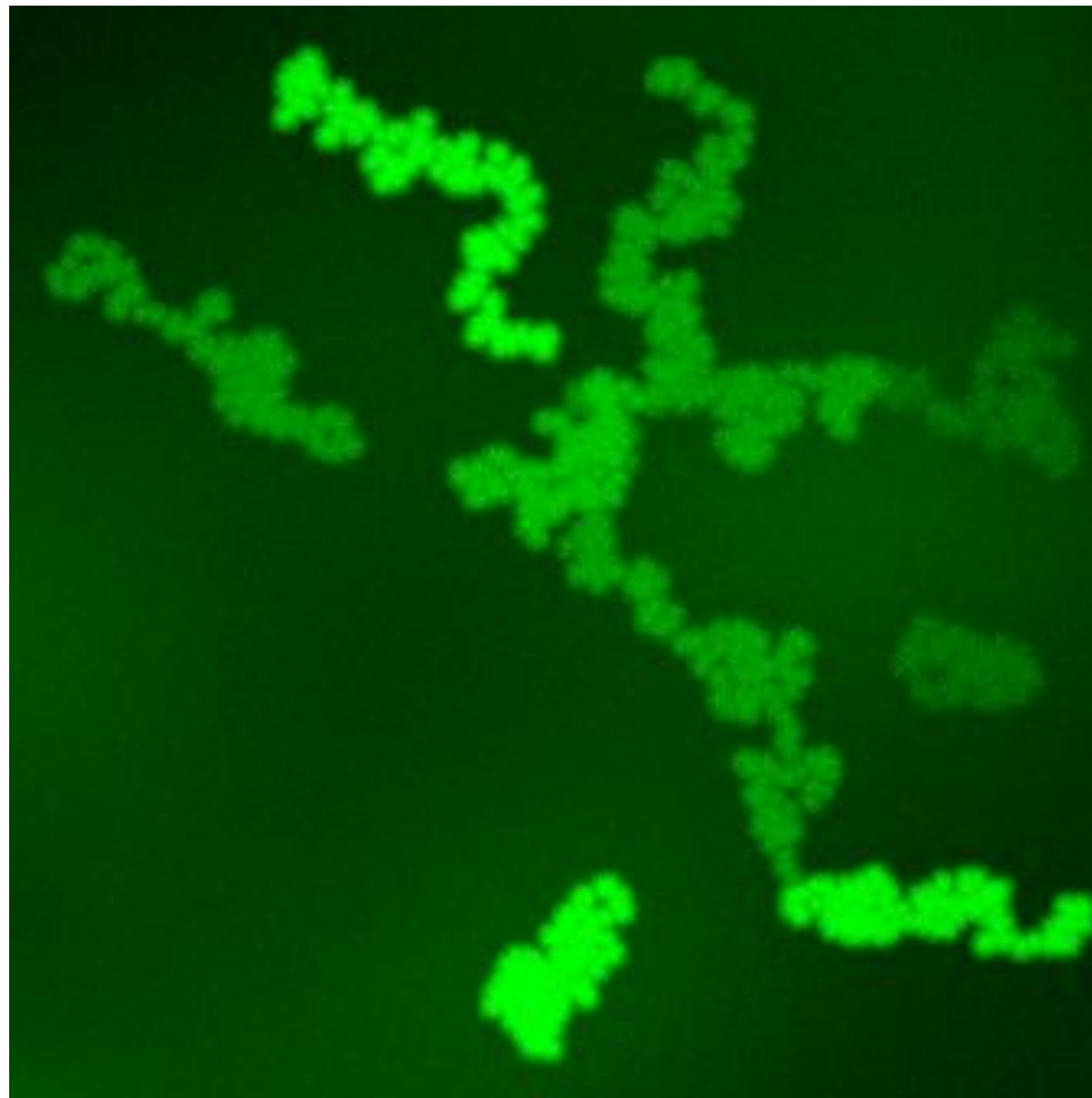


Application: Background Estimation

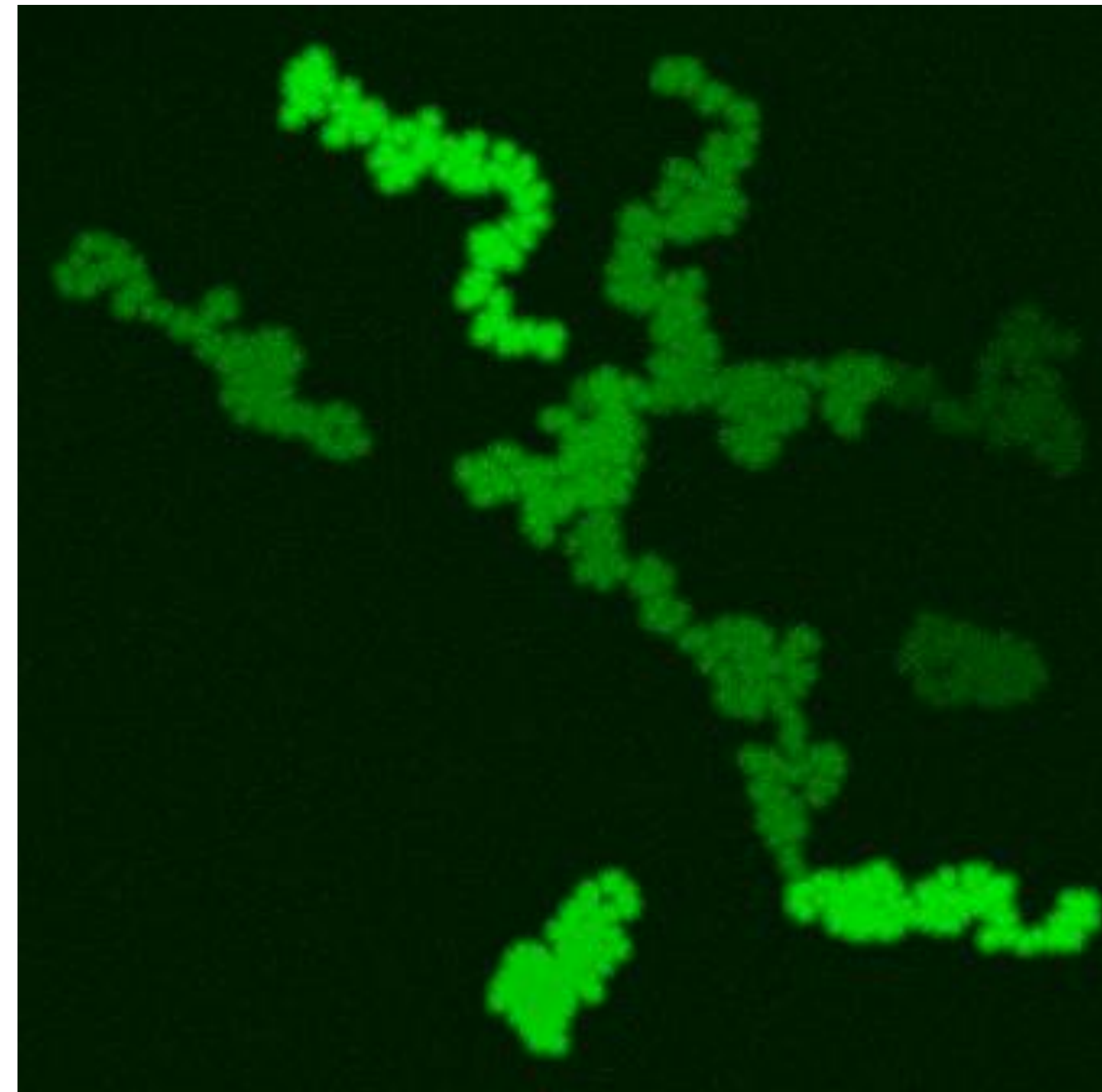


Application: Background Estimation

MIP



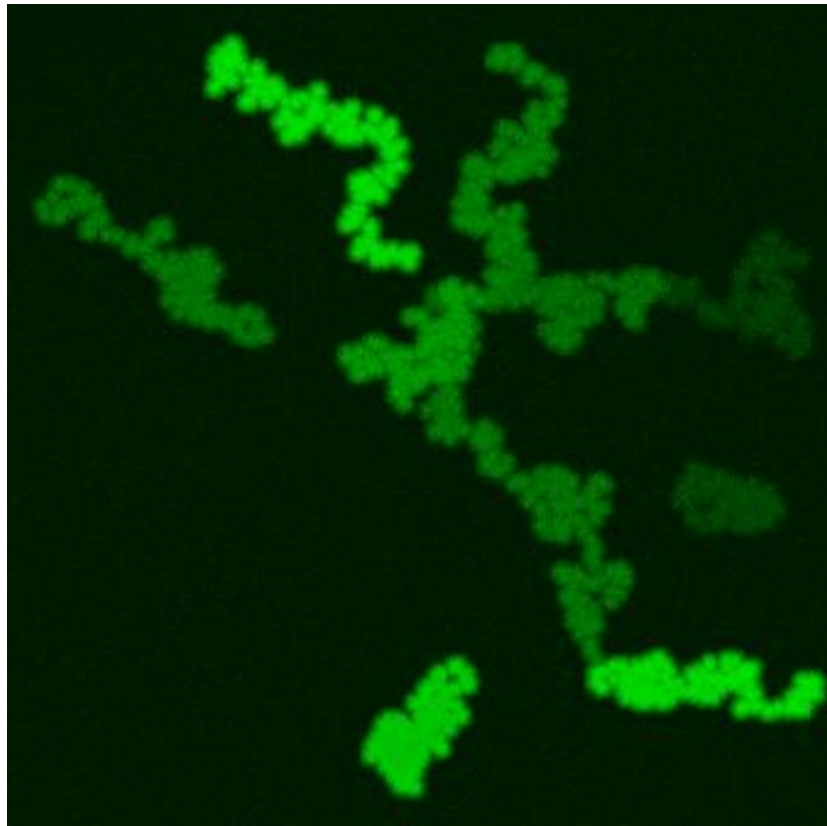
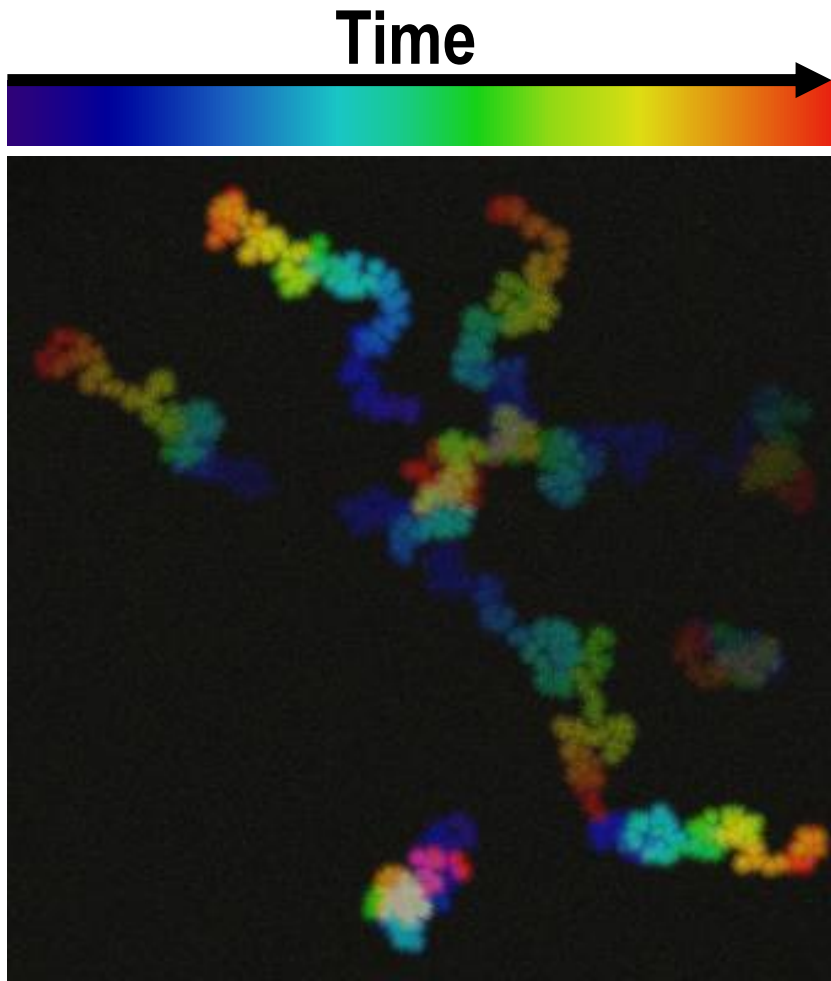
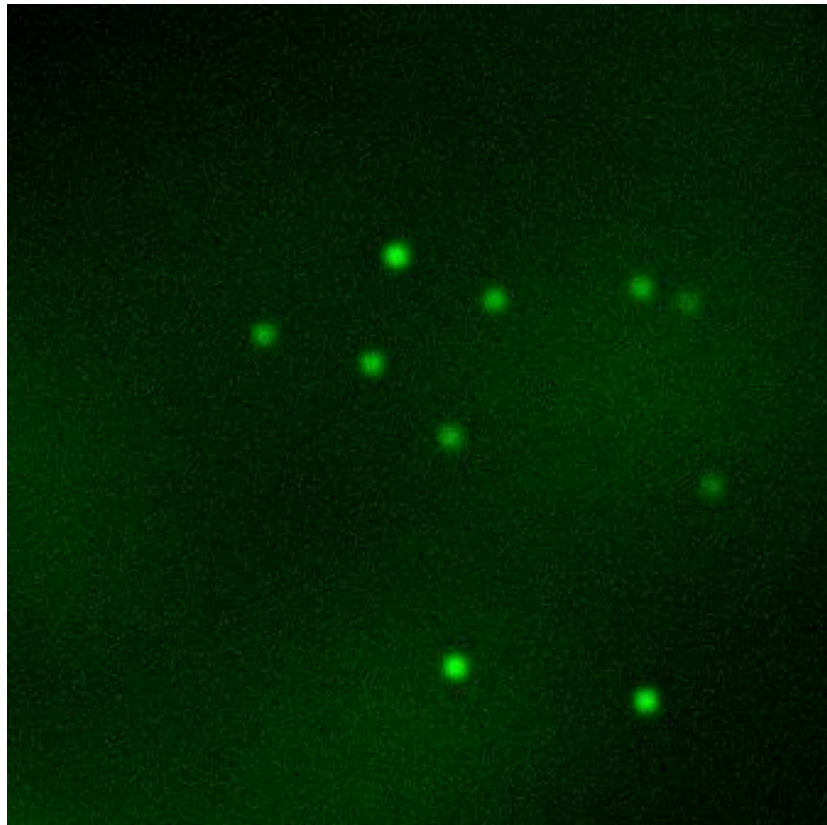
MIP
Corrected for Background



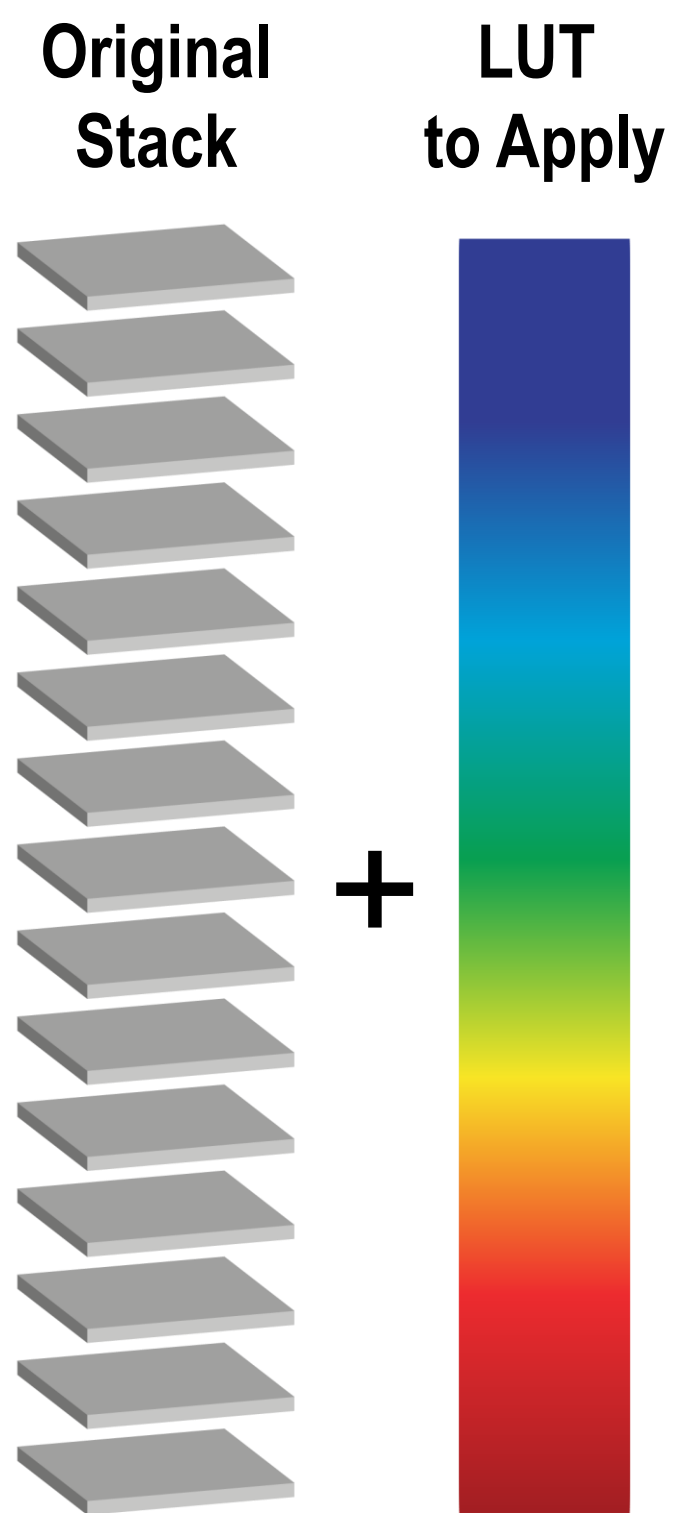
Keeping More Information: Depth Color Coding



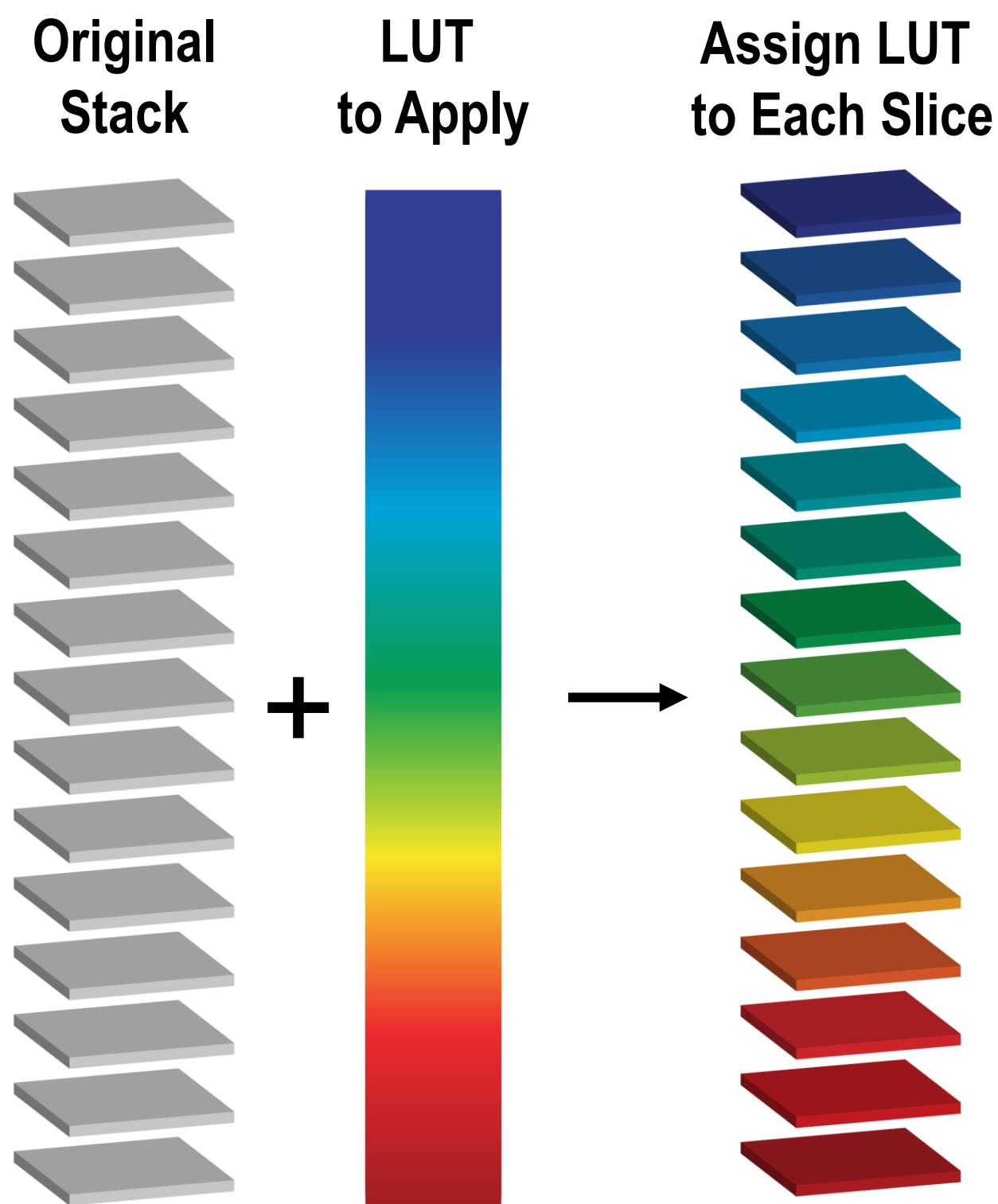
Image > Hyperstacks >
Temporal-Color Code



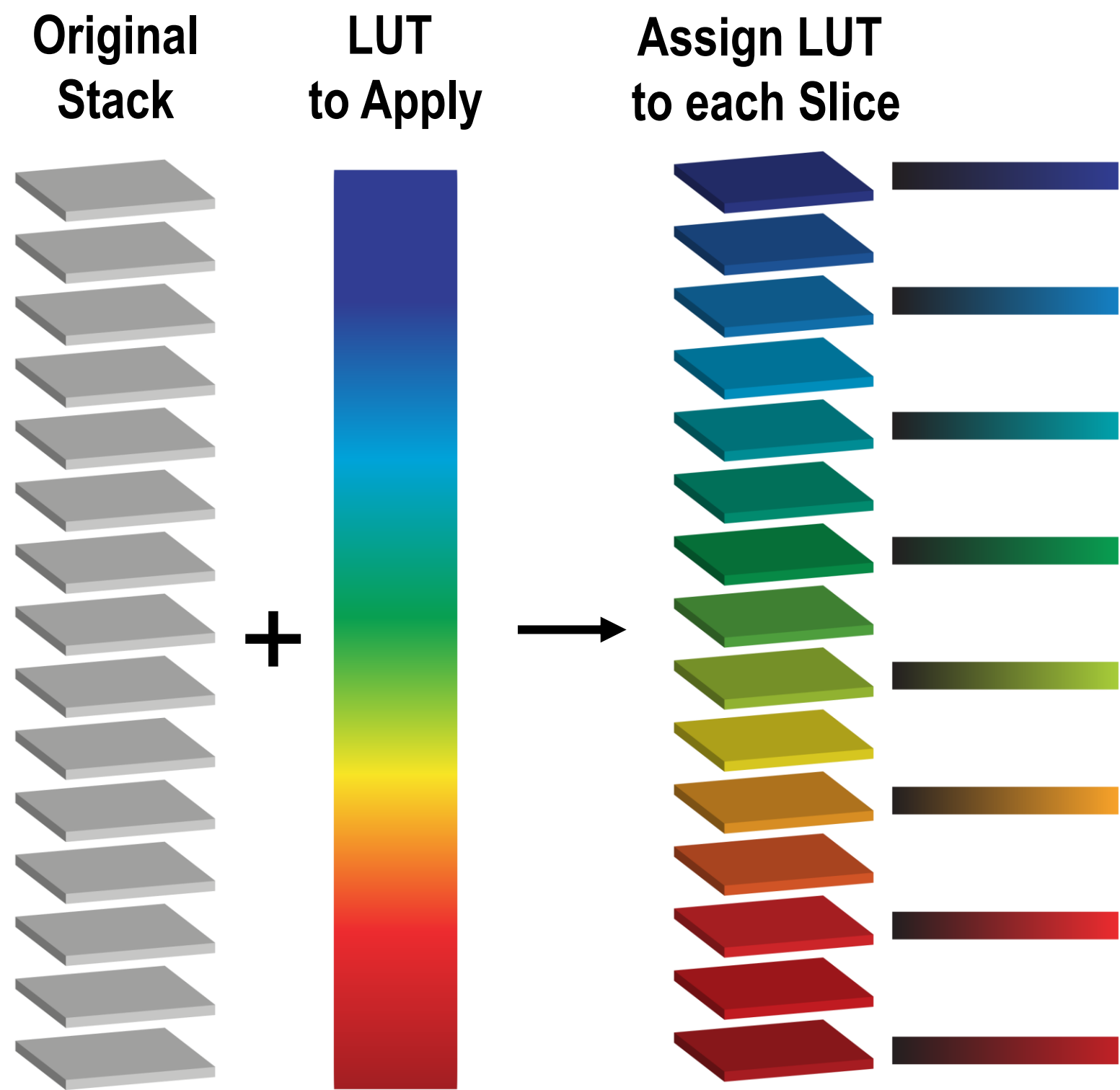
Keeping More Information: Depth Color Coding



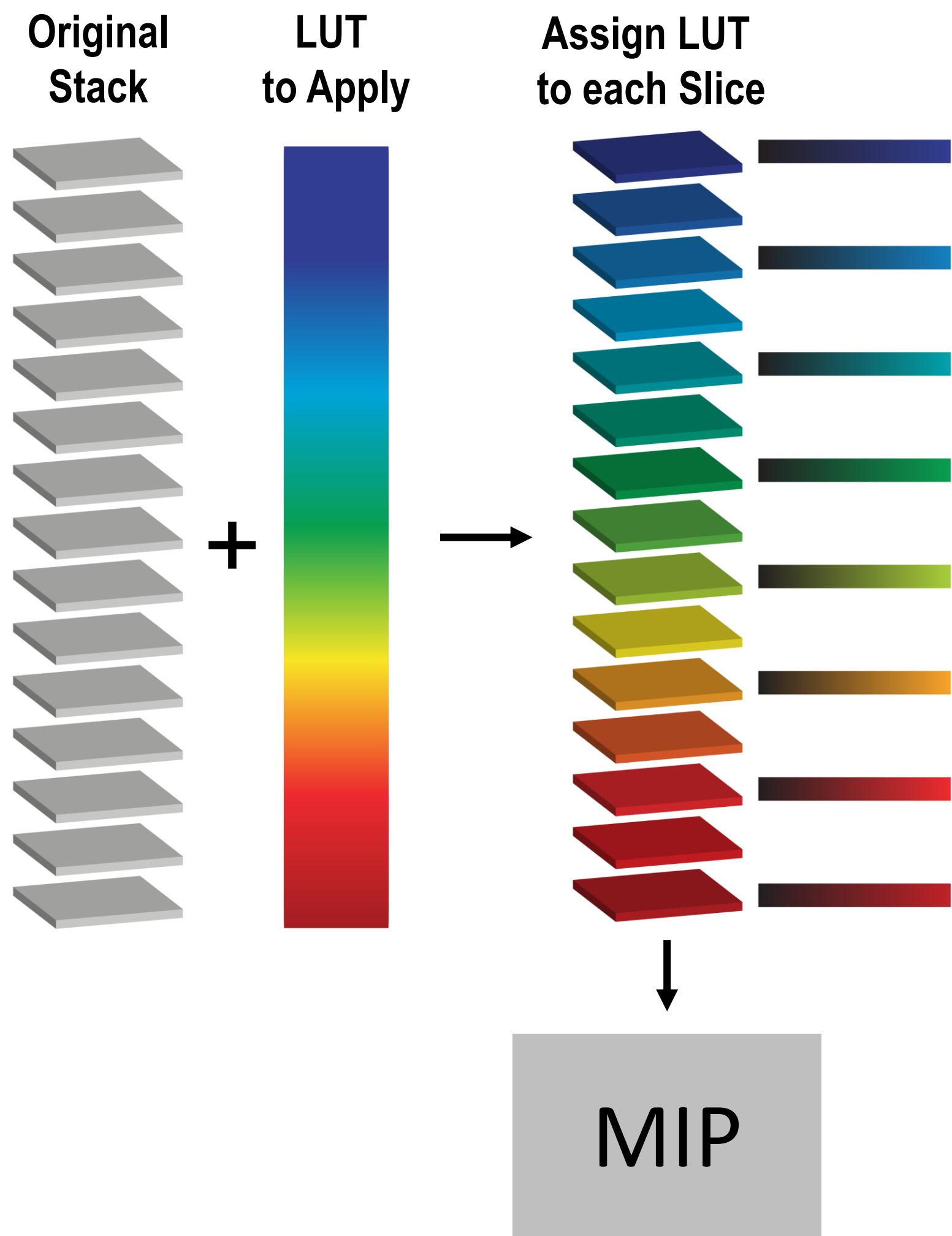
Keeping More Information: Depth Color Coding



Keeping More Information: Depth Color Coding

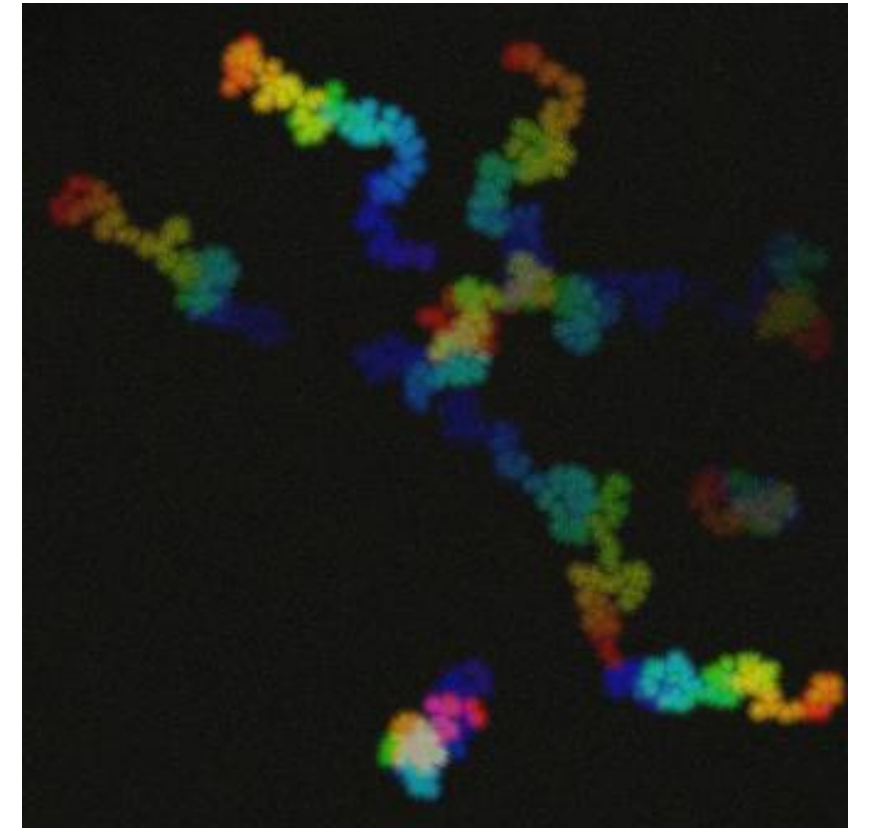


Keeping More Information: Depth Color Coding



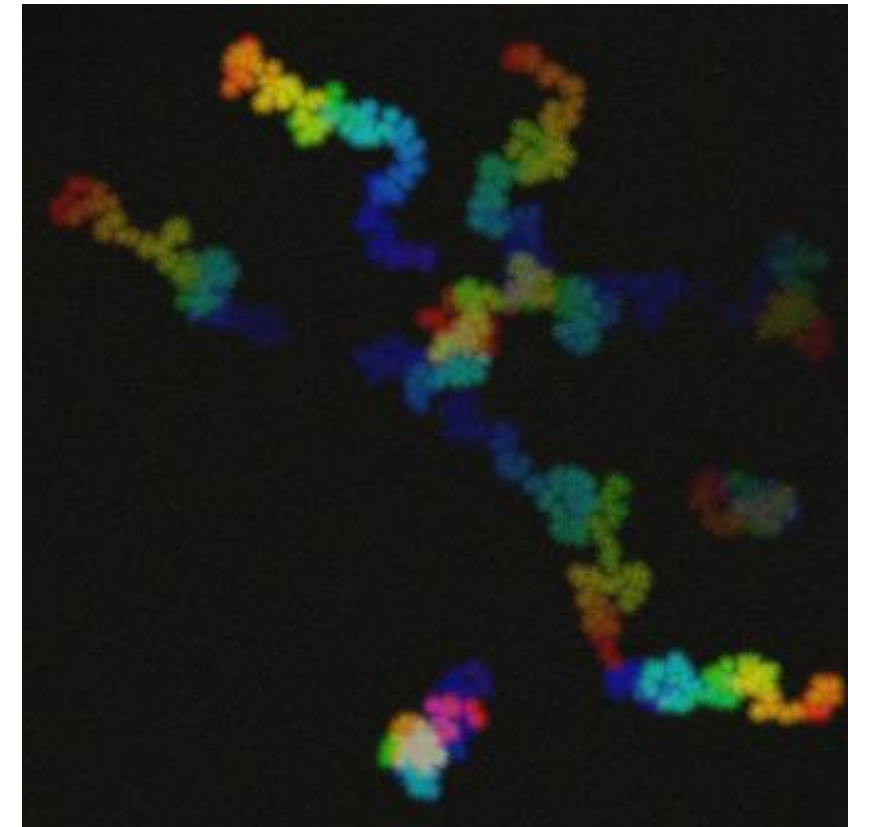
Good Resolution Leads to Useful Projections

T

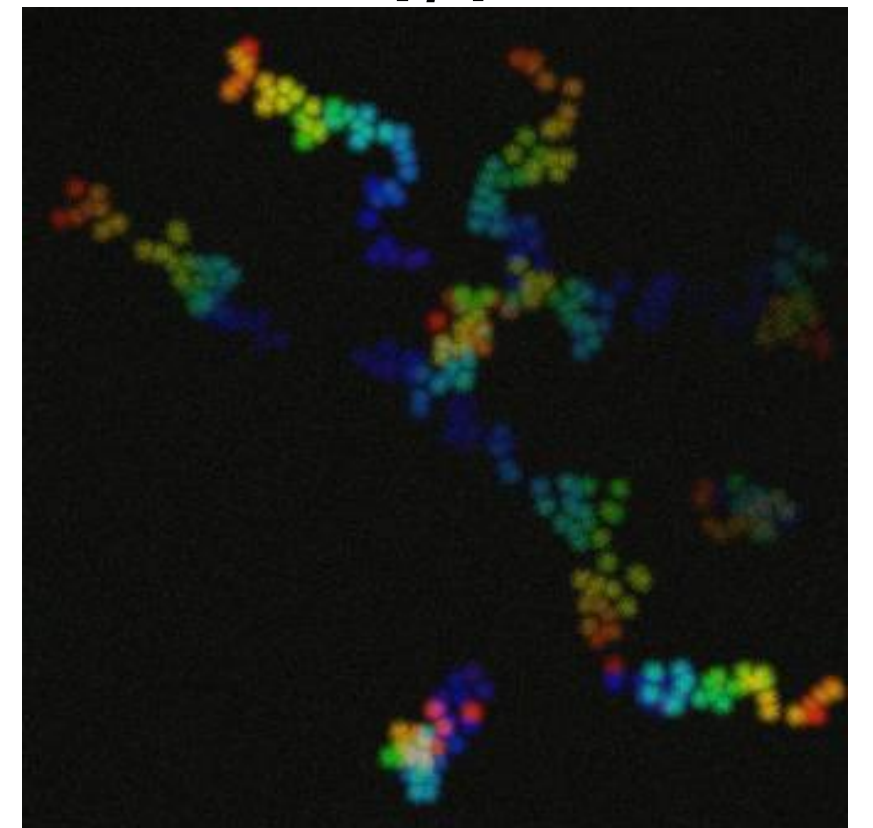


Good Resolution Leads to Useful Projections

T

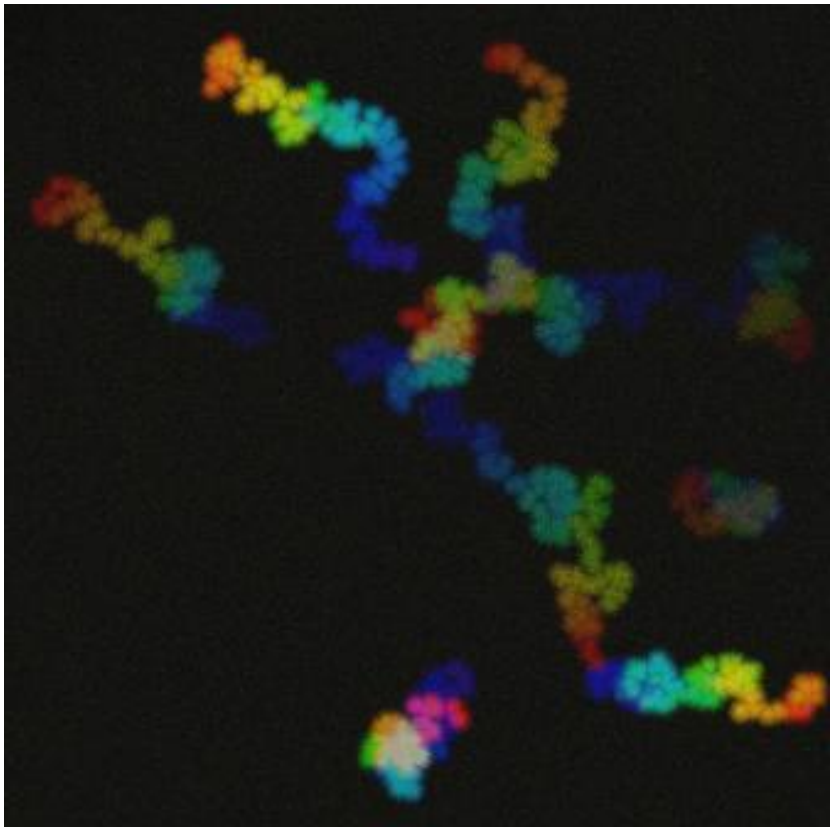


T/4

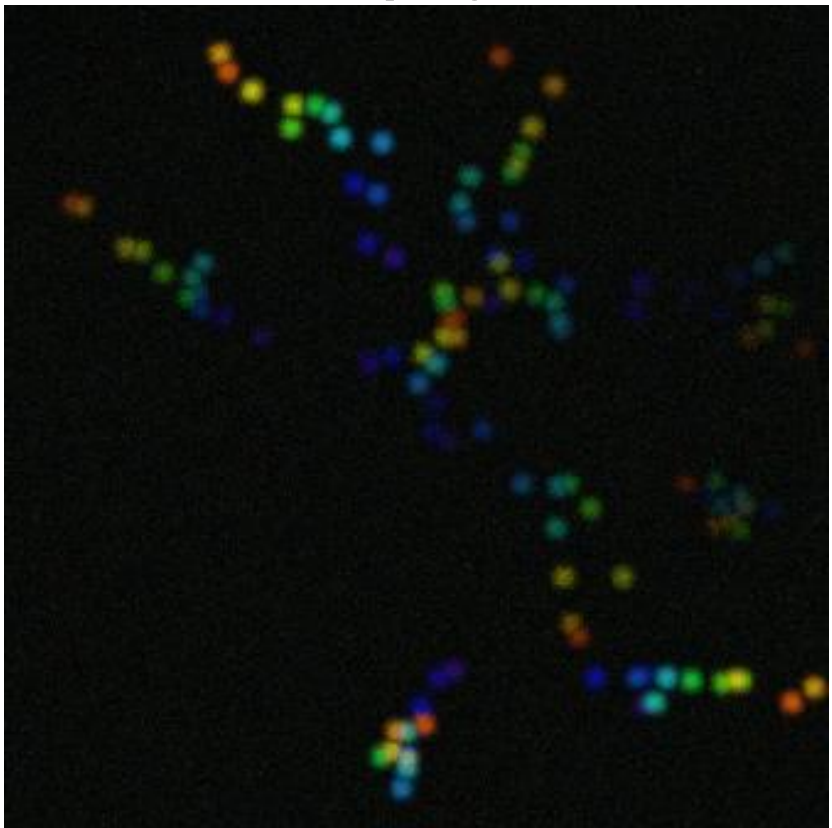


Good Resolution Leads to Useful Projections

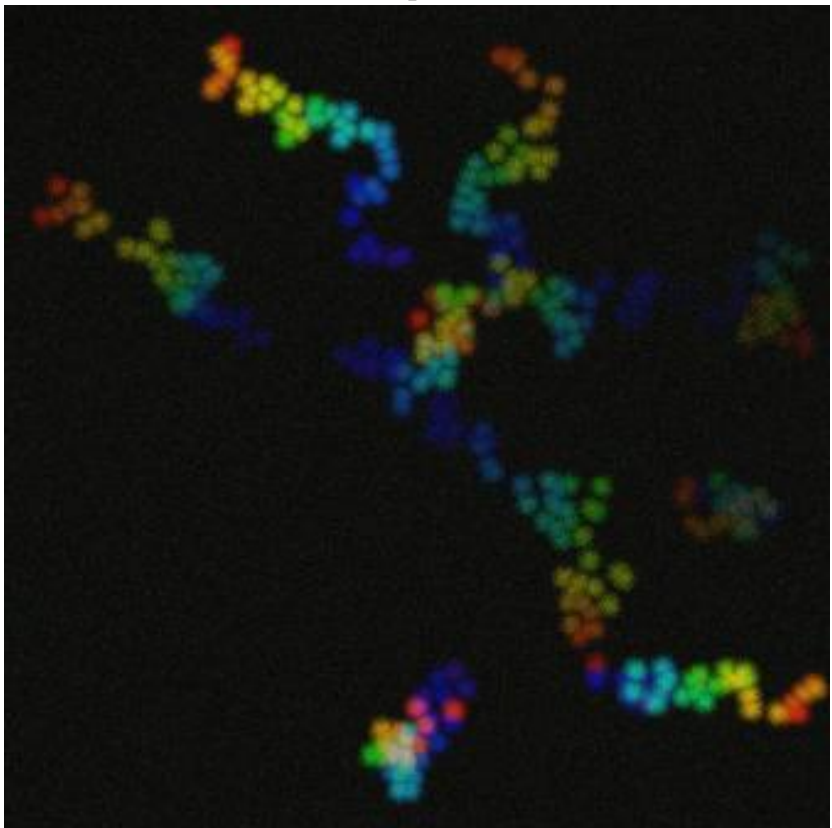
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T/16



T/4



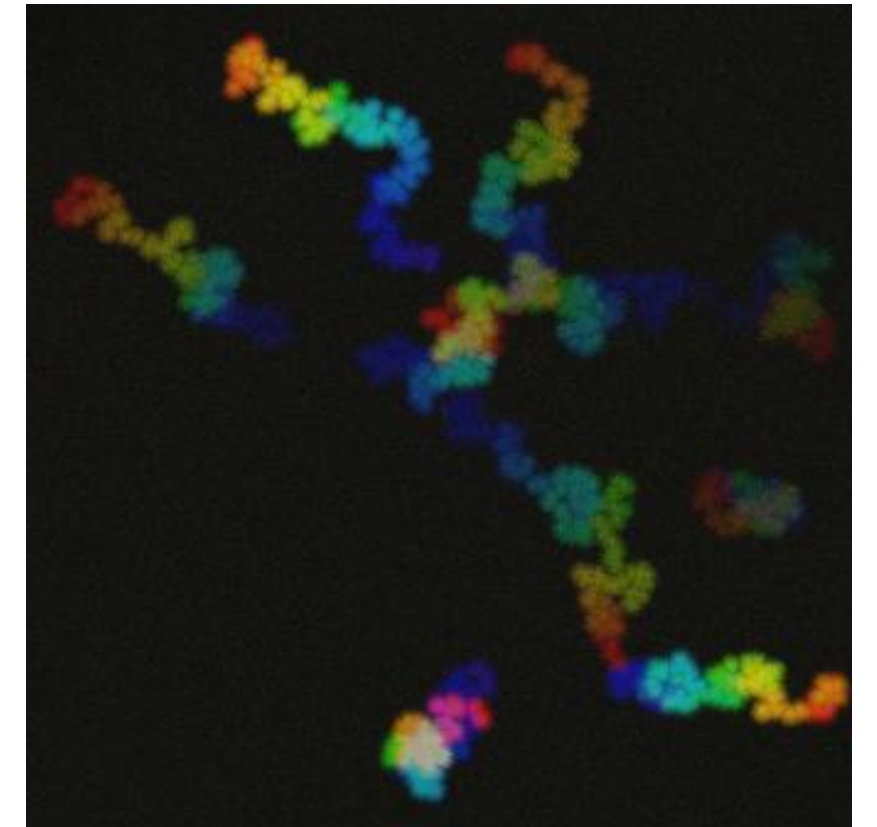
Good Resolution Leads to Useful Projections

“What is true
for Space is true
for Time”

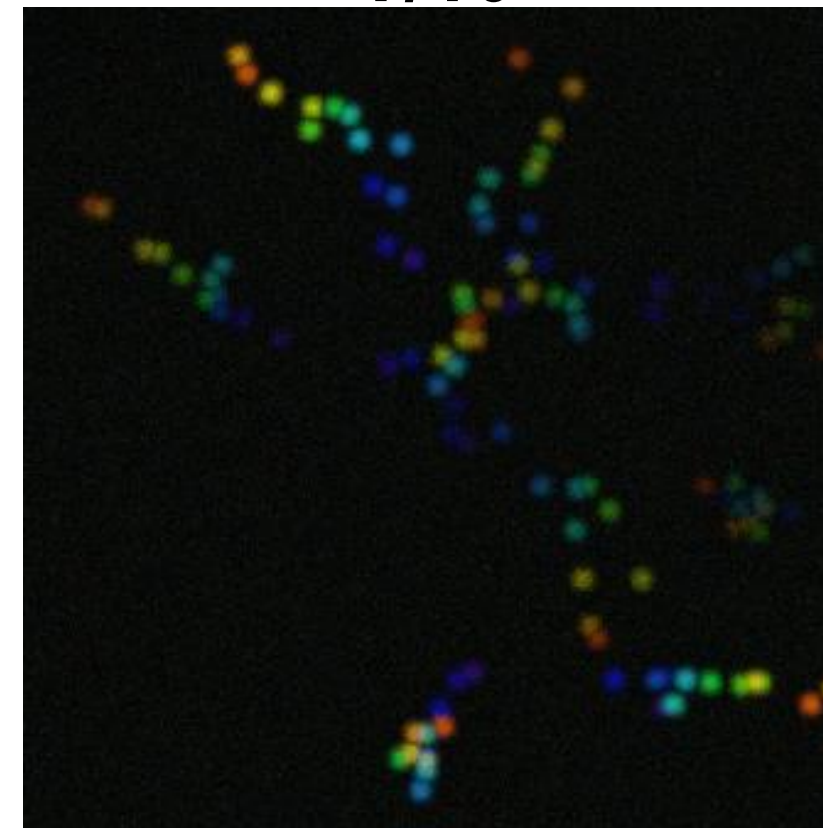
~R. Guiet



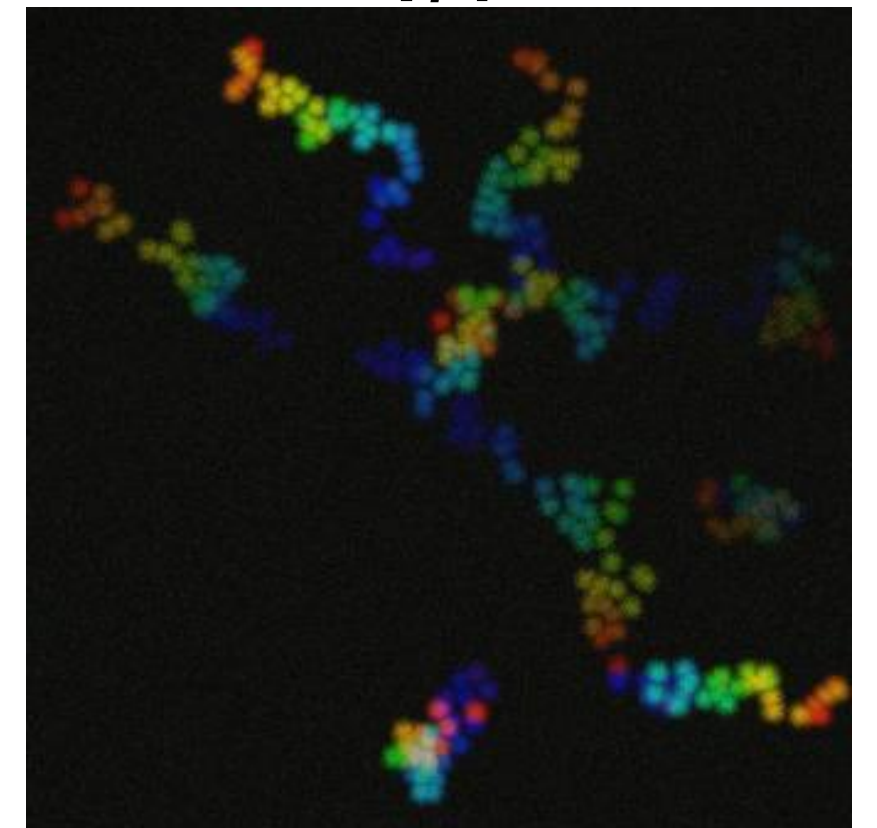
T



T/16



T/4



- Definition
 - Dimensionality Reduction
- Simple Projections
 - Mean, Min, Max, Median...
- Retaining More Information
 - Color Coding Time

