What is claimed is:

1. A system comprising:

a flow cell comprising a plurality of reaction sites a fluid inlet port and a fluid outlet port, wherein:

the plurality of reaction sites comprises a plurality of sets of reaction sites;

for each set of reaction sites from the plurality of sets of reaction sites:

that set of reaction sites is a subset of the plurality of reaction sites;

that set of reaction sites has a corresponding elevation relative to a bottom of the flow cell;

each reaction site comprised by that set of reaction sites is disposed on either a bottom surface of a corresponding well or a surface above the bottom surface of the corresponding well, and is located at that set of reaction sites' corresponding elevation relative to the bottom of the flow cell; and

no reaction site from any set of reaction sites other than that set of reaction sites is located at that set of reaction sites' corresponding elevation relative to the bottom of the flow cell;

a set of cameras; and

a processor connected to the set of cameras and programmed to:

receive a plurality of unfiltered images captured by the set of cameras, wherein the plurality of unfiltered images comprises, for each set of reaction sites from the plurality of sets of reaction sites, an image corresponding to that set of reaction sites; and

for each set of reaction sites from the plurality of sets of reaction sites, determine a derived image corresponding to that set of reaction sites, wherein the derived image corresponding to that set of reaction sites is based on using differences in focus between images from the plurality of unfiltered images to remove signals from reaction sites not comprised by that set of reaction sites while retaining signals from reaction sites comprised by that set of reaction sites;

wherein:

each set of reaction sites from the plurality of sets of reaction sites is disjoint with all other sets of reaction sites from the plurality of sets of reaction sites; and

for each image from the plurality of unfiltered images, that image depicts:

light emitted from reaction sites comprised by the set of reaction sites corresponding to that image; and

light emitted from reaction sites not comprised by the set of reaction sites corresponding to that image.

2. The system of claim 1, wherein:

for each reaction site from the plurality of reaction sites, that reaction site has a center;

for each reaction site in the plurality of reaction sites, there is an adjacent reaction site in the plurality of reaction sites, wherein a distance between the center of that reaction site and the center of the adjacent reaction site is less than a diffraction limit for a wavelength of light used in obtaining the plurality of unfiltered images; and

for each set of reaction sites from the plurality of sets of reaction sites, for each reaction site in that set of reaction sites, there is a neighboring reaction site in that set of reaction sites, wherein a distance between the center of that reaction site and the center of the neighboring reaction site is greater than the diffraction limit for the wavelength of light used in obtaining the plurality of unfiltered images.

3. The system of claim 1, wherein, for each set of reaction sites from the plurality of sets of reaction sites, the set of cameras comprises a corresponding camera focused with a focal plane at that set of reaction sites' corresponding elevation relative to the bottom of the flow cell.

4. The system of claim 3, wherein the system comprises a one or more beam splitters to direct signals from the plurality of reaction sites to the cameras from the set of cameras.

5. The system of claim 1, wherein the processor is programmed to:

cause a first camera from the set of cameras to capture a first unfiltered image, wherein the first unfiltered image corresponds to a first set of reaction sites from the

plurality of sets of reaction sites, and wherein the first camera is focused on a first focal plane at the first set of reaction sites' corresponding elevation relative to the bottom of the flow cell when it is caused to capture the first unfiltered image;

refocus the first camera on a second focal plane at the second set of reaction sites' corresponding elevation from the bottom of the flow cell; and

cause the first camera to capture a second unfiltered image, wherein the second unfiltered image corresponds to the second set of reaction sites, and wherein the first camera is focused on a second focal plane at the second set of reaction sites' corresponding elevation from the bottom of the flow cell when it is caused to capture the second unfiltered image.

6. The system of claim 1, wherein:

the set of cameras comprises a line scan camera;

the line scan camera comprises a plurality of sets of sensors, wherein, for each set of sensors from the plurality of sets of sensors:

that set of sensors has a corresponding set of reaction sites from the plurality of sets of reaction sites; and

that set of sensors is focused on a focal plane at its corresponding set of reaction sites' corresponding elevation relative to the bottom of the flow cell;

and

the processor is programmed to cause the line scan camera to:

capture a first unfiltered image using a first set of sensors, wherein the first set of sensors corresponds to a first set of reaction sites from the plurality of sets of reaction sites; and

capture a second unfiltered image using a second set of sensors, wherein the second set of sensors corresponds to a second set of reaction sites from the plurality of sets of reaction sites.

7. The system of claim 1, wherein:

each set of reaction sites from the plurality of sets of reaction sites has a corresponding point spread function; and

for each set of reaction sites from the plurality of sets of reaction sites, determining the derived image corresponding to that set of reaction sites comprises, for each other set of reaction sites from the plurality of sets of reaction sites, removing signals from reaction sites comprised by that other set of reaction sites using the unfiltered image corresponding to that other set of reaction sites and the point spread function corresponding to that other set of reaction sites.

8. The system of claim 7, wherein, for at least one set of reaction sites from the plurality of sets of reaction sites, the corresponding point spread function for that set of reaction sites is different from the corresponding point spread functions for all other sets of reaction sites from the plurality of sets of reaction sites.

9. The system of claim 7, wherein, for at least one set of reaction sites from the plurality of sets of reaction sites, the corresponding point spread function for that set of reaction sites is the same as the corresponding point spread function for at least one other set of reaction sites from the plurality of sets of reaction sites.

10. The system of claim 1, wherein the plurality of sets of reaction sites consists of two sets of reaction sites.

11. The system of claim 1, wherein the plurality of sets of reaction sites comprises three or more sets of reaction sites.

12. The system of claim 1, wherein, for each set of reaction sites from the plurality of sets of reaction sites, for each reaction site comprised by that set of reaction sites, that reaction site is located in a corresponding well comprised by the flow cell.

13. The system of claim 1, wherein, for each set of reaction sites from the plurality of sets of reaction sites, for each reaction site comprised by that set of reaction sites, that reaction site is located on a corresponding post comprised by the flow cell.