

## Visualizing the Very Small - The NISE Network VizLab

The nanoscale is so much smaller than our every-day surroundings that we can't see it in action; moreover, it's governed by physical forces beyond our experience. That's why tried-and-true methods of communicating information about complex domains—techniques of verbal description and visual illustration—may fail to accurately convey the structures and interactions of the nanoscale world without careful consideration and modification. The NISE Network's Visualization Laboratory (VizLab) at the Exploratorium is addressing these issues by exploring innovative ways of crafting visualizations to convey the very small. The illustrations, exhibits, and research of the VizLab are intended to support the NISE Network by providing resources and building knowledge of best practices to meet the challenge of representing the nanoscale landscape for a general public.

### Example Work: Size and Scale Diagrams

To understand why the nanoscale is different, we need to appreciate just how small it really is. One common way to represent the nanoscale visually relies on scale ladders—diagrams that show how objects are related by size. Using existing research on understanding size and scale, the VizLab carried out a series of experiments to develop effective scale ladders and guidelines for their design and use.

The enclosed scale ladder locates nano within a broader range of measurement. Based on traditional scale ladders, its purpose is to convey the size of the nanoscale (i.e., smaller than a cell and bigger than an



atom) to a wide range of audiences. It is therefore visually economical and aims for clarity without any single element standing out in a distracting or confusing way.

The VizLab scale ladder is available for general use, distribution, and modification under Creative Commons. Careful study and evaluation went into the creation of this resource; therefore, please review the enclosed Guidelines for the Design and Use of Scale Ladders before incorporating it into your own projects. For more information on the design of the Vizlab scale ladder and to download available files, please go to

[www.nisenet.org/community/groups/viz\\_lab/size\\_scale](http://www.nisenet.org/community/groups/viz_lab/size_scale)

### Additional VizLab Resources

For more information about additional VizLab research and resources, including multimedia zooms, nanoscale illustrations, an image database of vetted nano images for educational use, and nano-inspired art, please visit the VizLab Group page at

[www.nisenet.org/community/groups/viz\\_lab](http://www.nisenet.org/community/groups/viz_lab)

# GUIDELINES FOR THE DESIGN AND USE OF SCALE LADDERS

NISE Visualization Laboratory

## DESIGN GUIDELINES:

### • Ruler

A ruler is not needed to communicate relative size.

### • Objects

When used in an exhibit label, select objects specifically related to that exhibit, rather than including a variety of objects from different disciplines or choosing more familiar objects that are not directly related to the exhibit.

### • Scale Domains

Select easily recognizable objects to bracket the area being highlighted in the ladder.

## USE GUIDELINES:

- Use scale ladders to convey the size of objects *relative to one another*, not their absolute size.

- Consider using additional interpretative material in conjunction with the scale ladder to communicate the size of the nanoscale.

- Only use a scale ladder if it directly supports the main message of an exhibit or program.

