**story**

a story:  north space lights

take a fast car to space
study the fields of the small bits of space air
    that make the north space lights

see
count
what is here but not there
what is now but not then
take a short trip to space and back
to see what we can see

—it should just work
—check your grounds

is what you see here, the same as what you see there?
no? does it change in space?  does it change in time? or both?
look in many places at once and put the picture together
how does the system work together?
how does what happens here, change what happens over there?
how does what happened then, change what happens next?

build a lot of little space boats.
let them take a fast car to space.
lots of them, all going to space together.
lots and lots and lots.

all the little boats work together as a team to see
the fields of space air.
they ride above the movie of the north space lights.

—it should just work
—check your grounds

what do we learn from lot of little space boats looking together, over a movie of the north space lights?
many simple parts
different shapes and sizes
follow simple directions and
create a beautiful system tied together and changing in time.

what are the simple directions?
what are the important parts?
which are just for pretty?
how many of the very tiny parts do we have to see,
   to understand the way the whole system works?

let's go and see!
build a little space boat.  build three.  build ten.
make them work.
it should just work.  why doesn't it work.  check your grounds.  repeat.
it should just work.  why doesn't it work.  check your grounds.  repeat.
it works!  get them ready.

pile them onto the fast space car!
wait for the north space lights.  wait.
wait.
here they are! no.  not this time.  clouds.
winds. winds.  winds.
no space lights.  wait some more.
it stopped working!  fix it.

—it should just work
—check your grounds

fixed!
wait.  wait.  here come some lights.
are these good?  will they last?  ask the other cars which are already
up in space.  they say yes, lots of lights!
ok get ready.
pick up the count!
how are the winds?  are there any problems?
is it still working?  are there still lights?  keep counting.
3. 2. 1. go!
off to space in the fast space car
all the little boats move away from each other
to look at different places....still working, still lights, happy!

take all the bits of space air fields that all the boats see, and tell the computer about them.
also tell the computer about the movie of the north space lights.
can the computer figure out what happens in between all the boats?
can the computer figure out what happens next?  what happened before?
can we understand more than we can see....

…

so then what.
if we can understand more than we can see, what do we learn?

we can understand how the fields of space air will change if we push them.
we can understand what pushed them, if we see them change.
we can know more than we see.
so if we send our little space boats to another place, where we can see only a little, we can understand more from just a little bit of seeing.

also we can ask more interesting questions.
not just about what is happening right here right now,
but, how does what is happening here and now
   touch what is happening there and then.

we can see the north space lights and say,
   we know you!

thank you.