

# Machine learning and Mathematical physics

**Akinori Tanaka**, ITHES RIKEN w/ Akio Tomiya, CCNU

## Mathematical physics



I was like a boy playing on the sea-shore,  
diverting myself now and then finding a  
smoother pebble or a prettier shell than  
ordinary, whilst the great ocean of truth  
lay all undiscovered before me.  
(Issac Newton)

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Mathematical physics

## Discovering

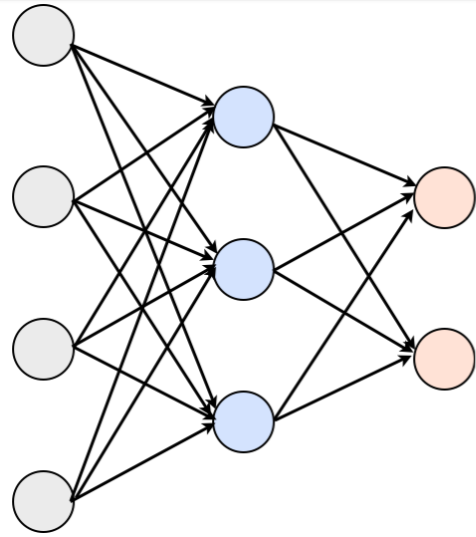
## “mathematical concepts”

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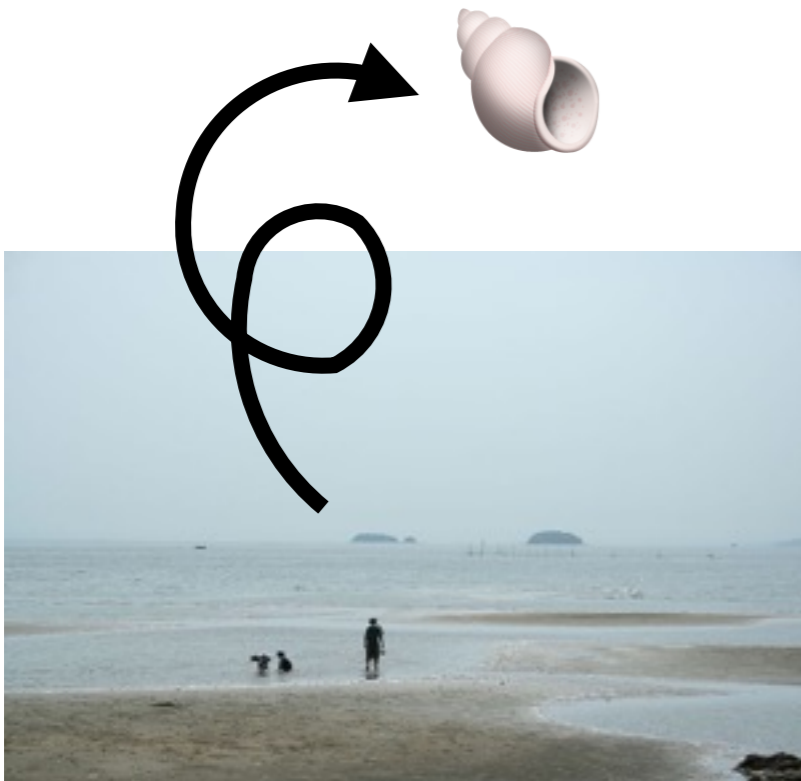
## Machine learning



Acquiring  
“concepts”



## Mathematical physics

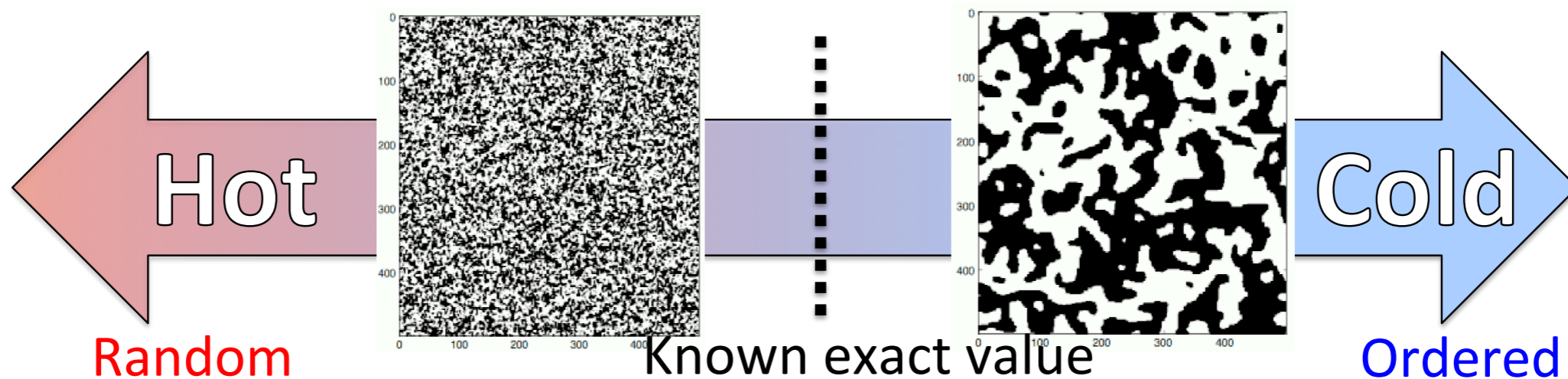


Discovering  
“mathematical concepts”

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# Ising model

Simple model of ferromagnet



## Appendix

1. Make NN.
2. Fight with it.