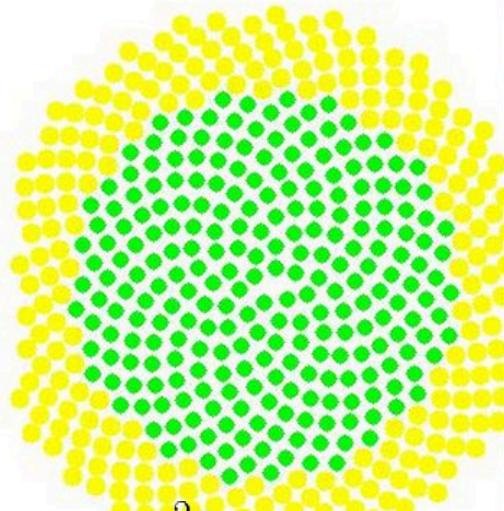


**GE1350**  
**Essential Mathematics in Daily  
Life**

從日常生活中尋找數學





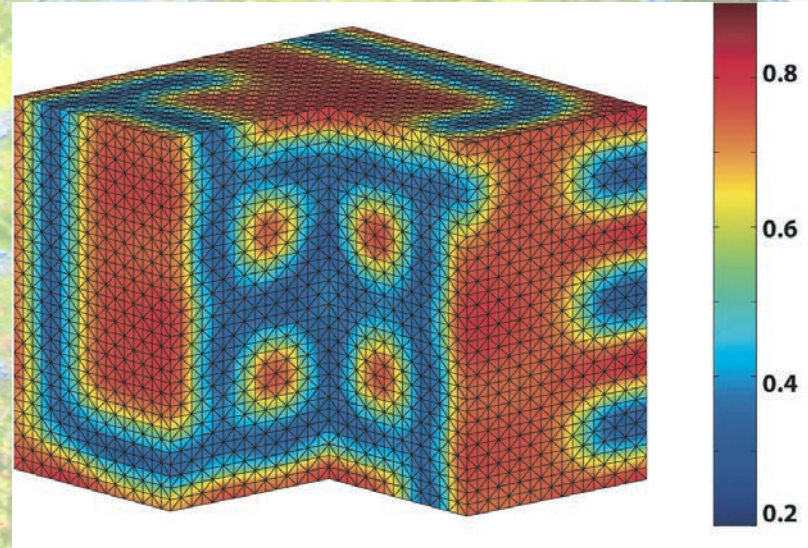
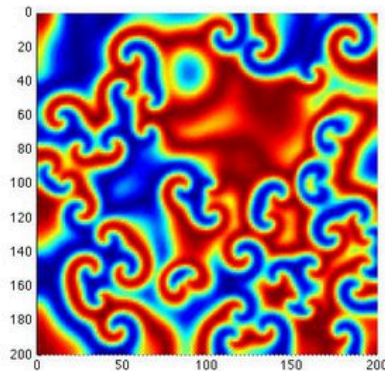
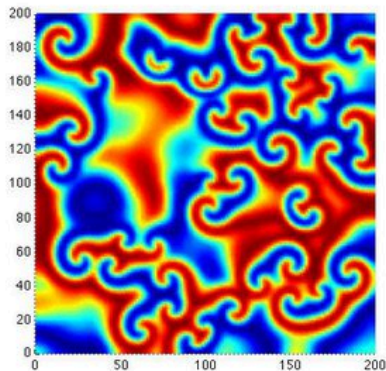
$$\theta = \frac{2\pi}{\phi^2}n, \quad r = c\sqrt{n}$$



“A mathematician, like a painter or poet, is a maker of patterns. If his patterns are more permanent than theirs, it is because they are made with ideas.”  
 – G. H. Hardy

$$\frac{\partial A}{\partial t} = D_A \Delta A - AS^2 + \rho(1 - A),$$

$$\frac{\partial S}{\partial t} = D_S \Delta S + AS^2 - (\rho + k)S,$$





**“We all use math every day. To predict weather...to tell time...to handle money. Math is more than formulas and equations. It’s logic; it’s rationality. It’s using your mind to solve the biggest mysteries we know.”**

**– TV Drama “Numb3rs”**

## Scientists find evidence of mathematical structures in classic books

Researchers at Poland’s Institute of Nuclear Physics found complex ‘fractal’ patterning of sentences in literature, particularly in James Joyce’s *Finnegans Wake*, which resemble ‘ideal’ maths seen in nature

Alison Flood

Wednesday 27 January 2016 16.45 GMT

James Joyce’s *Finnegans Wake* has been described as many things, from a masterpiece to unreadable nonsense. But it is also, according to scientists at the Institute of Nuclear Physics in Poland, almost indistinguishable in its structure from a purely mathematical multifractal.

From The guardian

*From big issues to small issues, all are mathematics.*

## Weather applications of mathematical statistics

January 29, 2016 by Setta Aspström



From Phys.org

## Mathematicians reveal the perfect way to cut pizza: 'Spiky' shapes allow unlimited number of equal slices

- Researchers designed a process that cut pizza pie into 12 equal slices
  - Now they found there is no limit to how many slices
  - Slices end up being curved bizarre shaped slices
- From Mail Online



© Joel Haddley

Two mathematicians revealed that cutting a pizza pie properly isn't just an art form, it's based on geometry. Previous research showed it is possible to create 12 equal slices in a pie, but the duo took it a step further and proved there is no limit to how many equal slices you can cut.

The application possibilities seem to be endless when it comes to mathematical statistics. Several of the researchers at the department work with issues related to weather, climate and environment – Igor Rychlik and David Bolin are two of them.



# Course Outline

## Four Topics

1. **Dynamical System and Population Biology**
2. **Combinatorics and Probability**
3. **Game Theory and Voting System**
4. **Number Theory and Cryptography**