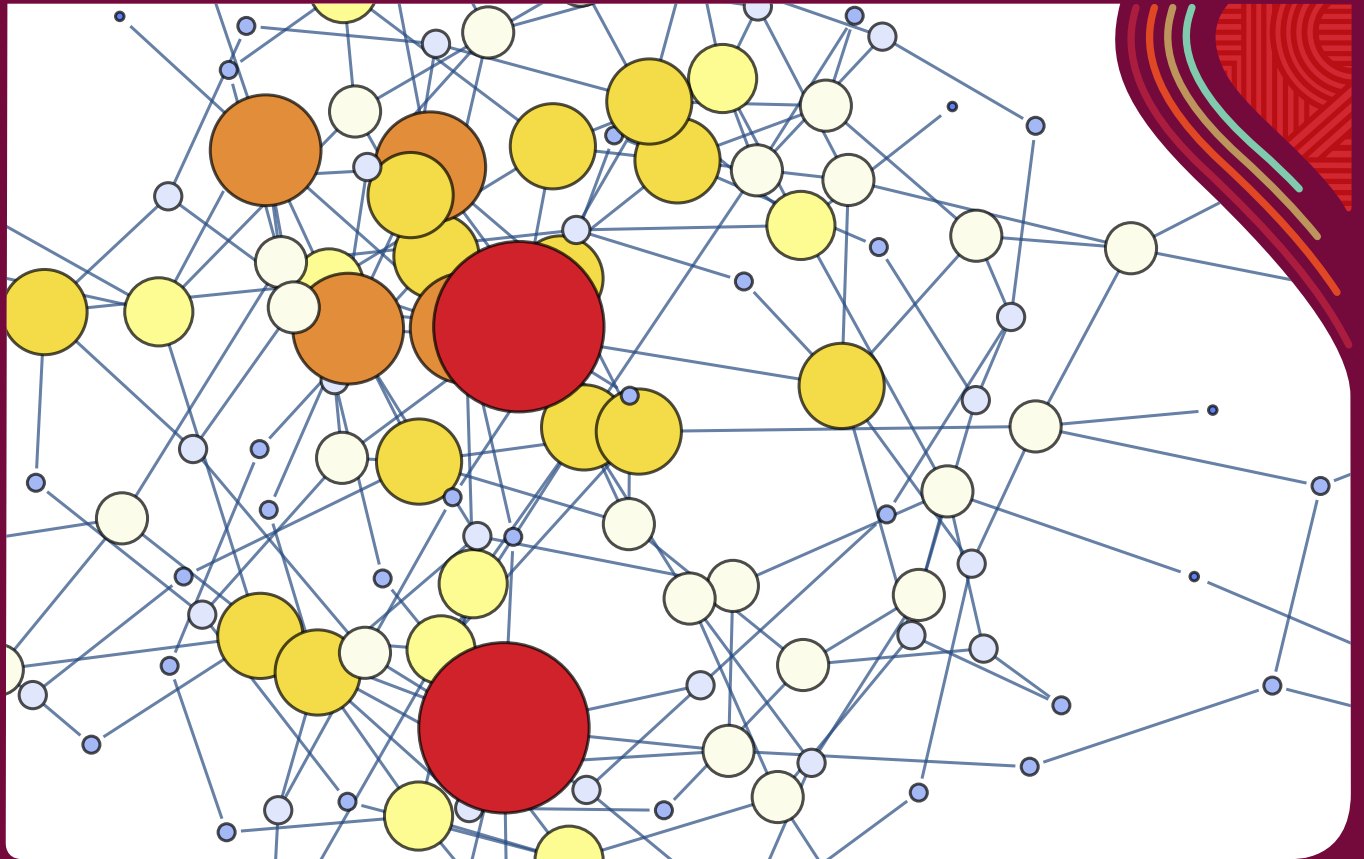




**Stellenbosch**  
UNIVERSITY  
IYUNIVESITHI  
UNIVERSITEIT

forward together  
sonke siya phambili  
saam vorentoe



# Applied Mathematics

[www.sun.ac.za](http://www.sun.ac.za)

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Department of Mathematical Sciences  
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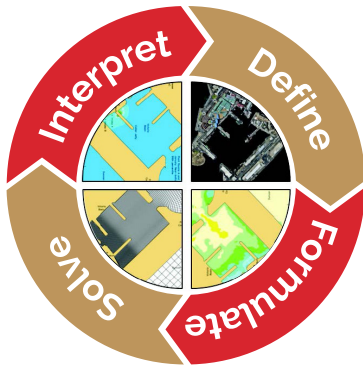
☎ +27 (0)21 808 4215

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<http://appliedmaths.sun.ac.za>

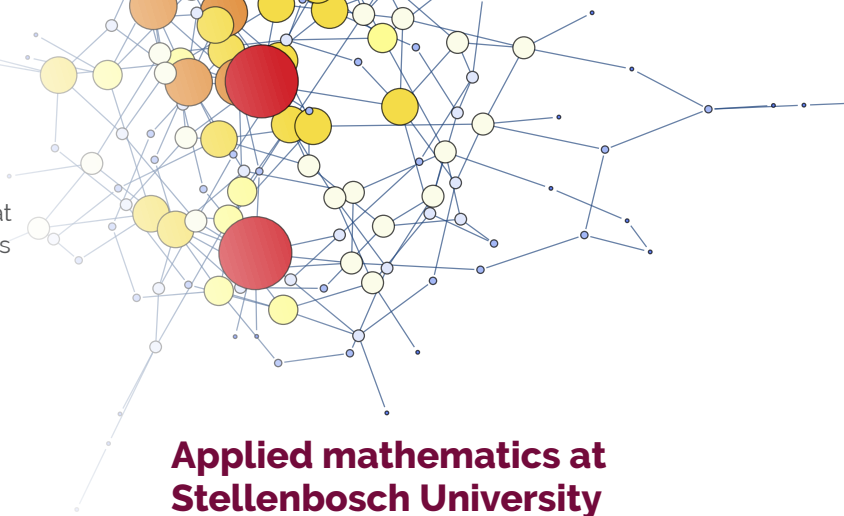
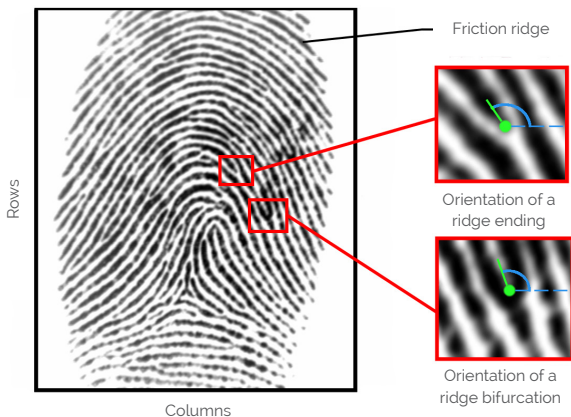
## What is applied mathematics?

Applied mathematics is a branch of mathematics that is concerned with developing mathematical methods and applying them to science, engineering, industry, and society.



## How does applied mathematics differ from pure mathematics?

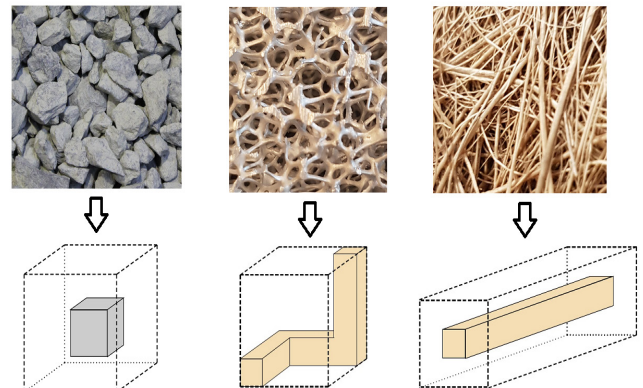
In applied mathematics, the discoveries and activities are driven by applications, while in pure mathematics it is the mathematics itself that drives the activities.



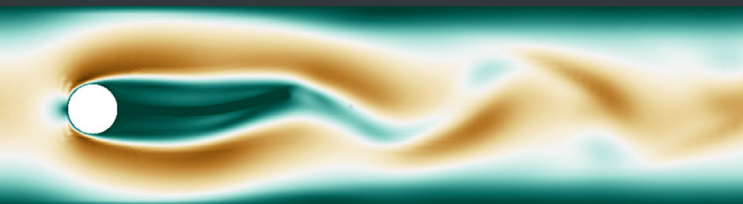
## Applied mathematics at Stellenbosch University

The division of Applied Mathematics at Stellenbosch University focuses on research in numerical analysis and scientific computing, computer vision and machine learning, fluid dynamics and modelling, and applied discrete mathematics. Our mission is to formulate and solve problems in all walks of life by developing and making use of mathematical methods in an innovative way.

Applied Mathematics, Computer Science and Mathematics form the three divisions of the Department of Mathematical Sciences in the Faculty of Science at Stellenbosch University. Applied Mathematics also has strong links with the Faculty of Engineering.



Different models in porous media



Fluid-structure interaction

## Which modules should I take?

### First Year

WS114: Probability theory and statistics

AM144: Modelling in mechanics

### Second Year

AM214: Applied matrix methods

AM244: Applied differential equations

### Third Year

AM314: Applied discrete mathematics

AM324: Numerical methods

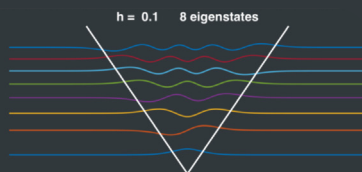
AM354: Flow modelling

AM364: Applied Fourier Analysis

### Honours

- Numerical methods
- Porous media
- Graph theory
- Computer vision
- Tensor analysis
- Numerical simulation of fluids
- Finite differences and finite element methods
- Applied markov processes
- Analytical methods of applied mathematics
- Applied nonlinear dynamics

```
% Create a chebfun on the interval [-3,3]
x = chebfun('x', [-3 3]);
% Define a potential function
V = abs(x);
% Plot the first 8 eigenstates of
% the Schrodinger operator
quantumstates(V, 8)
```



Eigenstates of the Schrödinger equation for a triangular potential

## What can I do with a degree in Applied Mathematics?

### Possibilities in academia

Research done within the division includes:

- Computer vision
- Machine learning
- Image processing
- Biometric authentication
- Fluid dynamics and modelling
- Porous media
- Coastal hydrodynamics
- Tensor analysis
- Finite element method
- Computational biomechanics
- Ballistics
- Numerical analysis and scientific computing
- Graph theory
- Statistical mechanics
- Large deviation theory

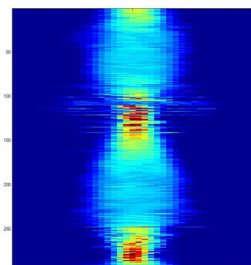
### Possibilities in industry

- Data scientist
- Data analyst
- Quantitative analyst
- Model development analyst (Banking)
- Actuarial analyst
- Supply chain analyst/ Demand planner
- Modeller
- Business analyst
- Cryptanalyst
- Forecast analyst
- Game designer
- Informatics scientist
- Investment analytics
- Operations researcher
- Project manager
- Research and development engineer
- Risk analyst
- Software developer
- Statistician

Blurred image

Estimated sinogram

Deblurred image



Process of deblurring images