



University of
Salford
MANCHESTER

BSc Physics

First Year (Level 4) Induction Session

Dr Dan Bull

11 September 2023	<i>Welcome/Induction</i>	0	
18 September 2023	Trimester 1	1	1
25 September 2023	Trimester 1	2	2 ✓
2 October 2023	Trimester 1	3	3 ✓
9 October 2023	Trimester 1	4	4 ✓
16 October 2023	Trimester 1	5	5 ✓
23 October 2023	Trimester 1	6	6 ✓
30 October 2023	Trimester 1	7	7 ✓
6 November 2023	Trimester 1	8	8 ✓
13 November 2023	Trimester 1	9	9 ✓
20 November 2023	Trimester 1	10	10 ✓
27 November 2023	Trimester 1	11	11 ✓
4 December 2023	Trimester 1	12	12 ✓
11 December 2023	Trimester 1	13	13 ✓
18 December 2023	<i>Christmas Vacation</i>	14	
25 December 2023	<i>Christmas Vacation</i>	15	
1 January 2024	<i>Christmas Vacation</i>	16	
8 January 2024	<i>Welcome/Induction</i>	17	✓
15 January 2024	Trimester 2	1	18 ✓
22 January 2024	Trimester 2	2	19 ✓
29 January 2024	Trimester 2	3	20 ✓
5 February 2024	Trimester 2	4	21 ✓
12 February 2024	Trimester 2	5	22 ✓
19 February 2024	Trimester 2	6	23 ✓
26 February 2024	Trimester 2	7	24 ✓
4 March 2024	Trimester 2	8	25 ✓
11 March 2024	Trimester 2	9	26 ✓
18 March 2024	Trimester 2	10	27 ✓
25 March 2024	<i>Easter Vacation</i>	28	(Bank Holiday Friday)
1 April 2024	<i>Easter Vacation</i>	29	(Bank Holiday Monday)
8 April 2024	<i>Easter Vacation</i>	30	
15 April 2024	Trimester 2	11	31 ✓
22 April 2024	Trimester 2	12	32 ✓
29 April 2024	Trimester 2	13	33 ✓

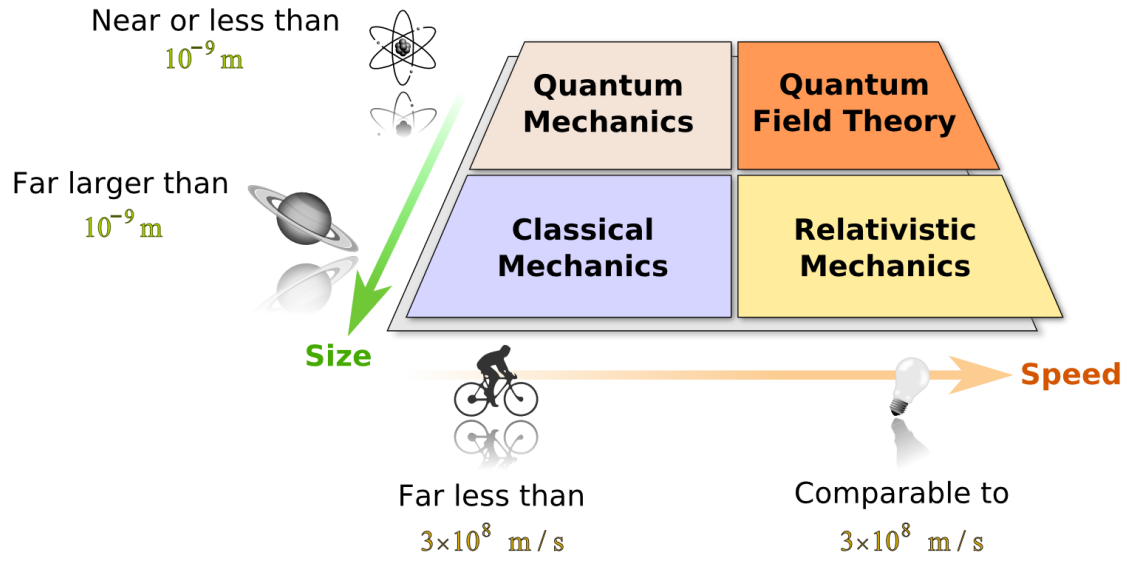
Trimester 1 Timetable

	9	10	11	12	13	14	15	16	17
Mon	Modelling of Physical Systems SEE Building: SB2 2.10						Electricity, Magnetism and Light SEE Building SB2.11		
Tue							Mathematics ONLINE DELIVERY		
Wed									
Thu	Physics Laboratory 1 SEE Building SB3.07 Physics in Context SEE Building SB3.01						Physics in Context SEE Building SB3.01 Physics Laboratory 1 SEE Building SB3.07		
Fri	Mathematics Peel 103		Physics in Context Peel 103				Mechanics, Relativity and Quantum Physics SEE Building SB2.11		

Location of Teaching Buildings



Mechanics, Relativity and Quantum Physics
Electricity, Magnetism and Light
Modelling of Physical Systems
Physics Laboratory 1
Mathematics
Physics in Context

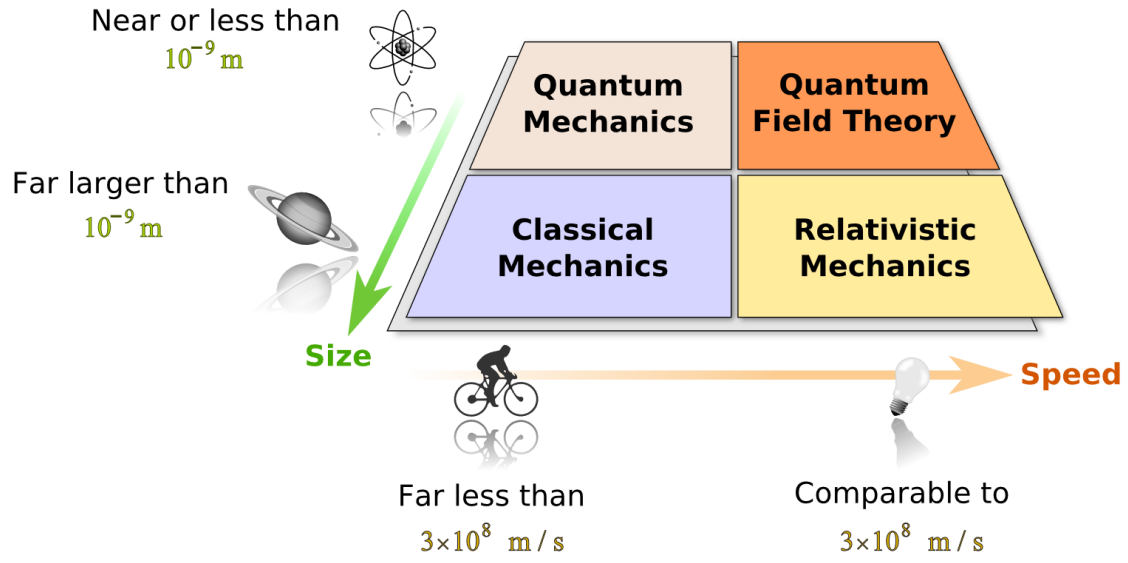


TRIMESTER 1: CLASSICAL MECHANICS

Prof Ian Morrison

- Dynamics in 1D, 2D and 3D
- Newton's Laws of Motion
- Work and Energy
- Momentum and Collisions
- Rotational Motion
- Angular Momentum

Mechanics, Relativity and Quantum Physics
Electricity, Magnetism and Light
Modelling of Physical Systems
Physics Laboratory 1
Mathematics
Physics in Context



TRIMESTER 2: RELATIVITY AND QUANTUM PHYSICS

Dr Marina Leontiadou

- The Postulates of Special Relativity
- Lorentz Transformation
- Relativistic Momentum and Energy
- The Origins of Quantum Physics
- Photons and Matter Waves
- Electrons in Confinement: Quantisation of Energy

Mechanics, Relativity and
Quantum Physics

Electricity, Magnetism and Light

Modelling of Physical Systems

Physics Laboratory 1

Mathematics

Physics in Context

TRIMESTER 1: ELECTRONICS AND ELECTRICITY

Dr Mark Hughes

- Electric current, voltage and resistance
- Electrical circuits and circuit networks
- Semiconductors
- Semiconductor Devices
- Electric Fields
- Capacitors and dielectrics

TRIMESTER 2: ELECTRIC AND MAGNETIC FIELDS

Dr Tiehan Shen

- Magnetic fields
- Electromagnetic Induction
- Inductors
- Alternating current
- Electromagnetic waves
- Ray optics

Mechanics, Relativity and
Quantum Physics

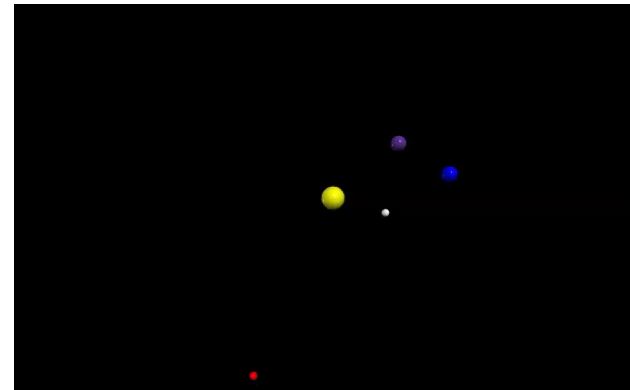
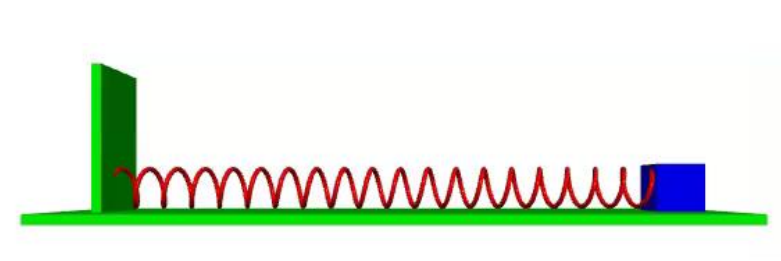
Electricity, Magnetism and Light

Modelling of Physical Systems

Physics Laboratory 1

Mathematics

Physics in Context



TRIMESTER 1 MOTION OF PHYSICAL SYSTEMS

Dr Dan Bull

- Projectile motion under the effects of both gravity and air resistance
- Oscillatory motion: Linear simple harmonic motion and beyond
- Gravitation including planetary and satellite motion
- The motion of charged particles in electric fields

Mechanics, Relativity and
Quantum Physics

Electricity, Magnetism and Light

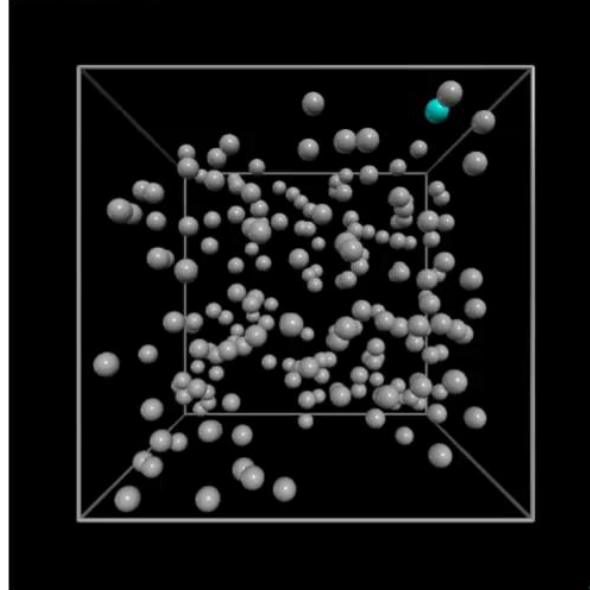
Modelling of Physical Systems

Physics Laboratory 1

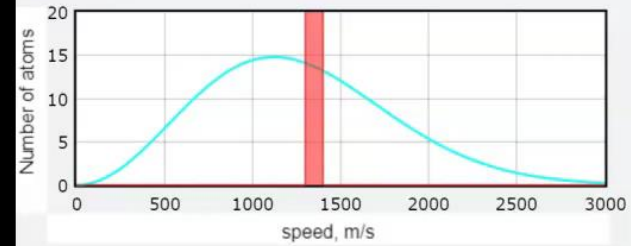
Mathematics

Physics in Context

A "hard-sphere" gas



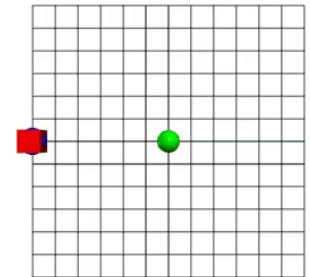
Theoretical and averaged speed distributions (meters/sec). Initially all atoms have the same speed, but collisions change the speeds of the colliding atoms. One of the atoms is marked and leaves a trail so you can follow its path.



TRIMESTER 2: THERMAL PHYSICS AND WAVES

Dr Dan Bull

- Kinetic theory in gases: The origin of pressure; the Maxwell speed distribution
- Temperature and thermal transport
- The zeroth, first and second law of thermodynamics
- Basic statistical mechanics
- Transverse and longitudinal travelling waves
- Superposition of waves and standing waves
- Sound waves and the doppler effect



Mechanics, Relativity and
Quantum Physics

Electricity, Magnetism and Light

Modelling of Physical Systems

Physics Laboratory 1

Mathematics

Physics in Context

TRIMESTERS 1&2

Dr Mark Hughes, Dr Heather Yates, Dr John Proctor

- Measurement Skills, including quantifying precision
- Propagation of Errors
- Data Manipulation in a Spreadsheet
- Plotting of Data
- Curve Fitting
- Electronics
- Keeping an Effective Experimental Logbook
- A series of experiments across a range of areas in physics
- Reporting of Experiments in Physics

Mechanics, Relativity and
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Modelling of Physical Systems

Physics Laboratory 1

Mathematics

Physics in Context

TRIMESTERS 1&2

Dr Graham McDonald

- Algebra and Functions
- Differentiation and Integration
- Geometry: Co-ordinate systems
- Vectors
- Complex Numbers
- Ordinary Differential Equations: First Order Equations; Second Order Equations, Applications to Simple Physical Systems
- Series: Notions of Convergence; Taylor and Maclaurin Series Expansions; Power Series; Fourier Series

TRIMESTERS 1&2

Prof Ian Morrison

- ❑ A series of short thematic keynote lecture courses including seminars by external speakers demonstrating the role of the physicist in the workplace and the role of physics in addressing real world problems
- ❑ Skills Elements: Problem solving; team building; research skills; presentation skills; report writing and graphical presentation skills:
 - ❑ Learning how to present to different audiences
 - ❑ The development of free scientific thinking, to be able to look at problems and issues from different viewpoints and to formulate and present ideas;
 - ❑ The use of Fusion360 CAD/CAM software;
 - ❑ Producing an effective LinkedIn profile;
 - ❑ Scientific report writing and the research of relevant data, including the importance of accurate referencing

Mechanics, Relativity and
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Electricity, Magnetism and Light

Modelling of Physical Systems

Physics Laboratory 1

Mathematics

Physics in Context

Assessment Deadlines

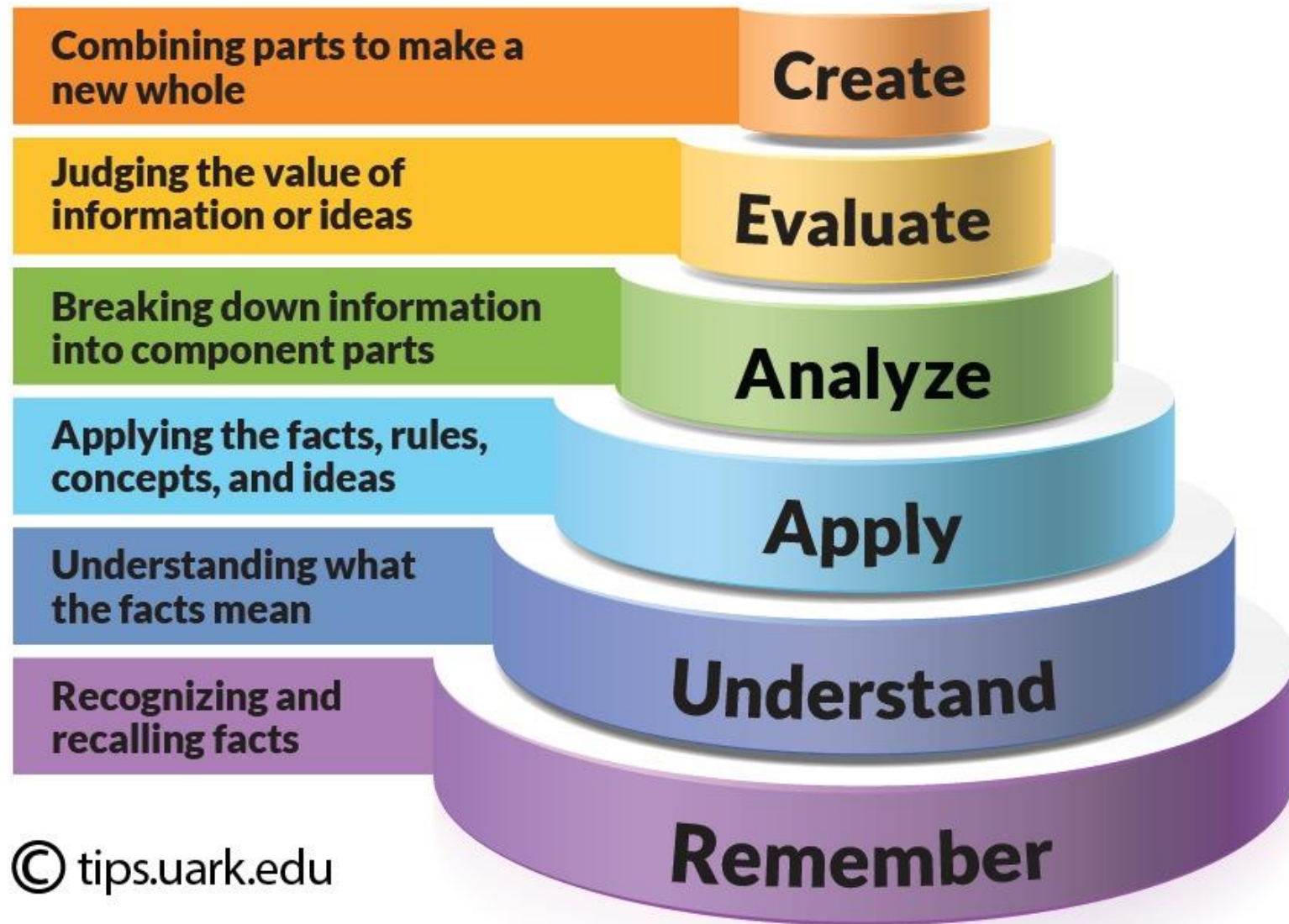
TRIMESTER 1 ASSIGNMENT DEADLINES

Modelling of Physical Systems	50%	Wednesday 6 th December
Mathematics	50%	Monday 11 th December
Mechanics, Relativity and Quantum Physics	50%	Wednesday 13 th December
Electricity, Magnetism and Light	50%	Friday 15 th December

TRIMESTER 2 ASSIGNMENT DEADLINES

Physics Laboratory 1 (Experimental Journal)	70%	Wednesday 14 th February
Physics in Context (Problem Solving Journal)	70%	Friday 23 rd February
Physics Laboratory 1 (Electronics Journal)	30%	Wednesday 17 th April
Physics in Context (Energy Project)	30%	Friday 19 th April
Modelling of Physical Systems	50%	Monday 22 nd April
Mathematics	50%	Friday 26 th April
Mechanics, Relativity and Quantum Physics	50%	Wednesday 1 st May
Electricity, Magnetism and Light	50%	Friday 3 rd May

Bloom's Taxonomy of Learning



What is the purpose of the physics degree?

➤ TO LEARN PHYSICS

➤ TO LEARN TO **BECOME A PHYSICIST**