



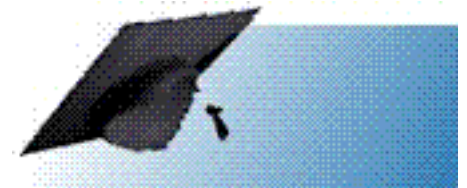


# Faculty Focus

*Biological & Health Sciences*

# Agenda

- Overview of the various disciplines in the turf
- Common “horizontal” solutions  
Data acquisition, QuickTime, statistics
- Macintosh in Teaching
- Macintosh in Research
- Vendor demonstration
- Discussion



# The Disciplines

## Biological Sciences

Zoology

Entomology

Physiology & Pharmacology

Biochemistry

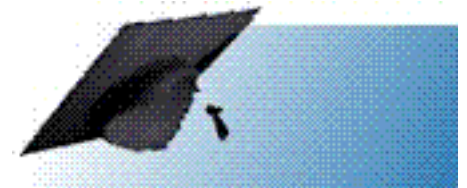
Microbiology

Botany

Anatomy

Parasitology etc etc ...

Molecular biology is a discipline within all of these



# The Disciplines

## Health Sciences

Vet Science

Dentistry

Pharmacy

Occupational therapy

Physiotherapy

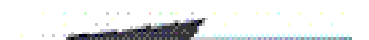
Speech pathology

Audiology

Nursing

Medicine

Again, Molecular biology is used in many of these



# The Disciplines

## Medicine

Surgery

Medicine

Pathology

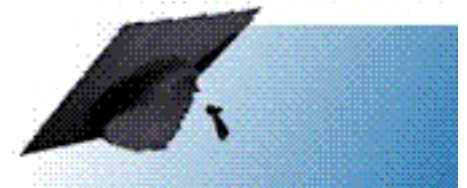
Obstetrics & Gynaecology

Psychiatry

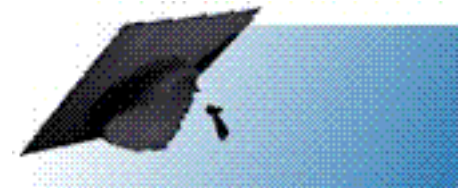
Social & preventative

Radiology

Dermatology etc etc . . . .



# Let's get horizontal



# Let's get horizontal

Location: <http://www.coh.uq.edu.au/marketing/opening/index.html> What's Related

THE UNIVERSITY OF QUEENSLAND

UQ Home Search Site Index Contacts FAQs Library

Centre for Online Health

## IT-enabled home care the key to health in the next millennium

Federal Health Minister Dr Michael Wooldridge launched a new initiative on November 4 which is expected to shift resources away from hospital-based care and into the home

**Thursday, November 4, 1999**

**Dr Wooldridge** launched the Centre for Online Health at the University of Queensland's St Lucia campus. A recording of the life broadcast of the opening is available at: [www.coh.uq.edu.au](http://www.coh.uq.edu.au)

The launch included live links, facilitated by Picturetel to CSIRO in Sydney, a demonstration of international emergency care to San Diego using technology developed in Brisbane by Distributed Systems Technology Centre (DSTC), and a home care presentation by the Centre and Apple.

Centre for Online Health director and head of UQ's Psychiatry Department Professor Peter Yellowlees said the

Watch the broadcast with QuickTime Player

### How to watch

#### 1 The Technology Required.

QuickTime 4.0  
[Download Here](#), if you don't have it already.

An Internet browser, version 4.0 or higher.

Recommend a 56K Internet connection or greater.

Be sure and open the QuickTime Settings control panel and set your connection speed.

COH

00:00:01





Apple logo

# QuickTime VR


Netscape: A Journey Through the Heart


Location: <http://www.gmc.uq.edu.au/plpk/externalframe.html> What's Related

## A Journey through the Heart

 Outside the Heart     Journey Inside     Echocardiography     Help

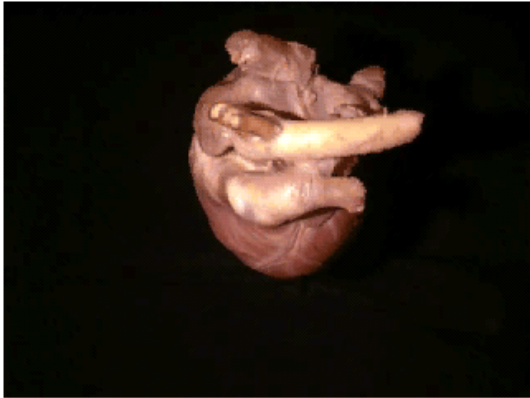
**Click on Thumbnails to examine different Views**

  
[Examine the whole heart externally](#)

  
[Examine the sectioned](#)

### Structure of the heart

**External view of a complete heart**



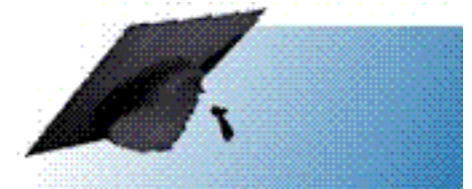
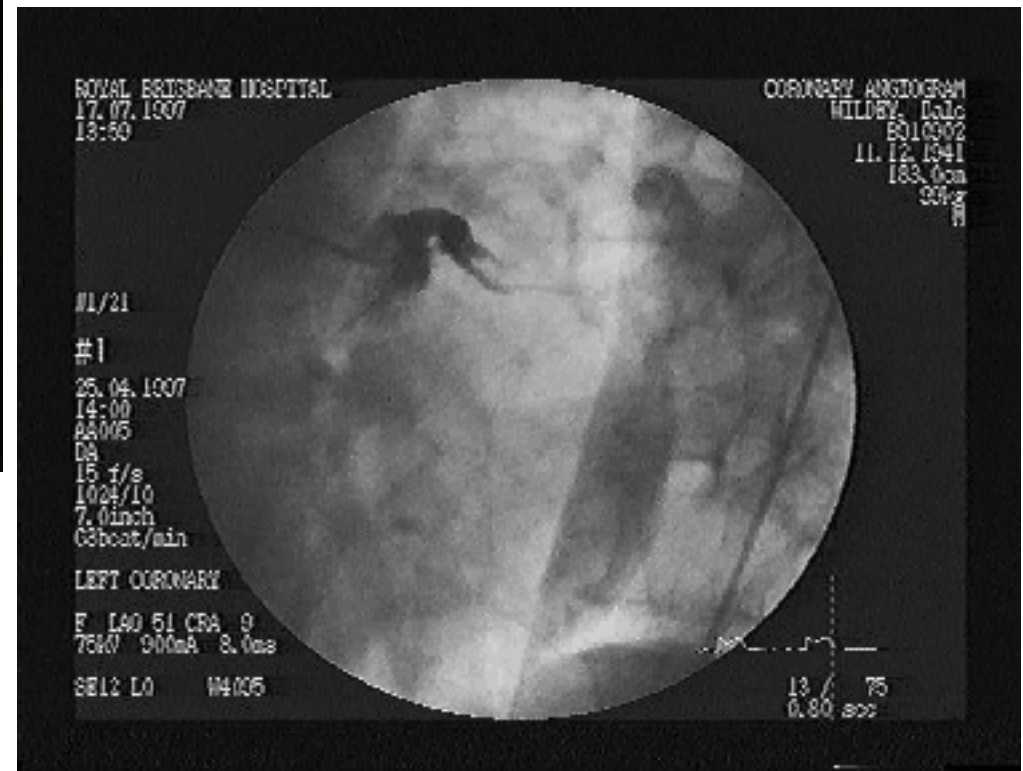
**Click over heart and drag to rotate**

The heart has four chambers. The upper two are the right and left atria; the lower two, the right and left ventricles. The heart also has four valves that open and close to allow blood to flow in only one direction when the heart contracts (beats).

**The four heart valves are:**

- the tricuspid valve, located between the right atrium and right ventricle;
- the pulmonary or pulmonic valve, between the right ventricle and the pulmonary artery;
- the mitral valve, between the left atrium and left ventricle; and

# QuickTime VR



# QuickTime Streaming

Netscape: QuickTime TV test

Location: <http://neon.chem.ox.ac.uk/vrchemistry/chemistrytv/chemistrytv.html> What's Related


## Chemistry QuickTime TV

We have launched streaming QuickTime TV channels for chemistry education.

The initial offering is a collection of six 12 minute video by CALTech on the following subjects: **Atomic Orbitals, The Structure of Crystals, VSEPR Theory, Stereochemistry, Nucleophilic Substitution, & The Diels- Alder Reaction.**

The broadcast for copyright reasons is only available on the University of Oxford campus.

You do need Apple QuickTime 4 to view these online streaming channels. The software is available for Windows 95/98/NT4 and MacOS.

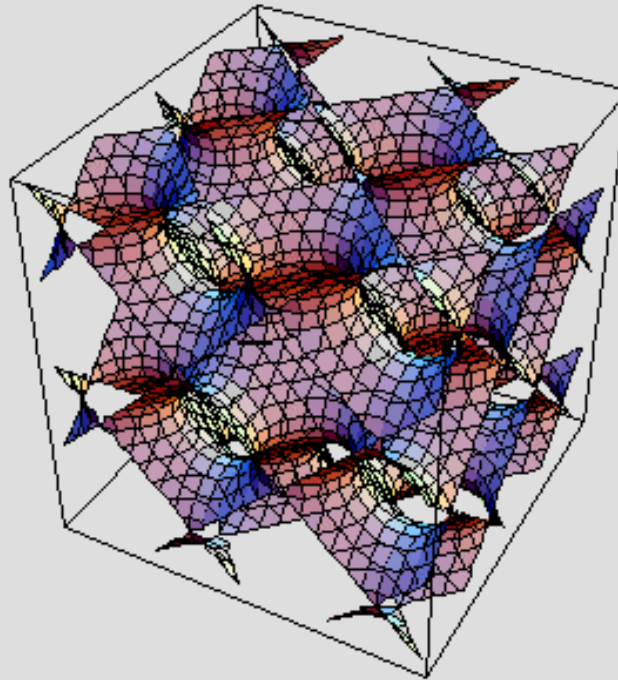
 Come back for other offerings including chemistry lectures.

[Previously these videos were available using Real streaming technology.](#)

Click to start the streaming channels

# Visualisation

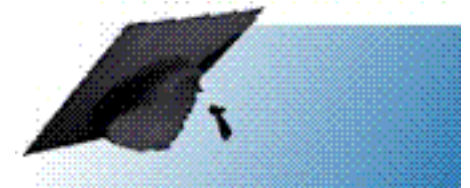
```
In[4]:= ContourPlot3D[Sin[x] + Sin[y] + Sin[z], {x, -2 π, 2 π},  
{y, -2 π, 2 π}, {z, -2 π, 2 π}, PlotPoints → 6]
```



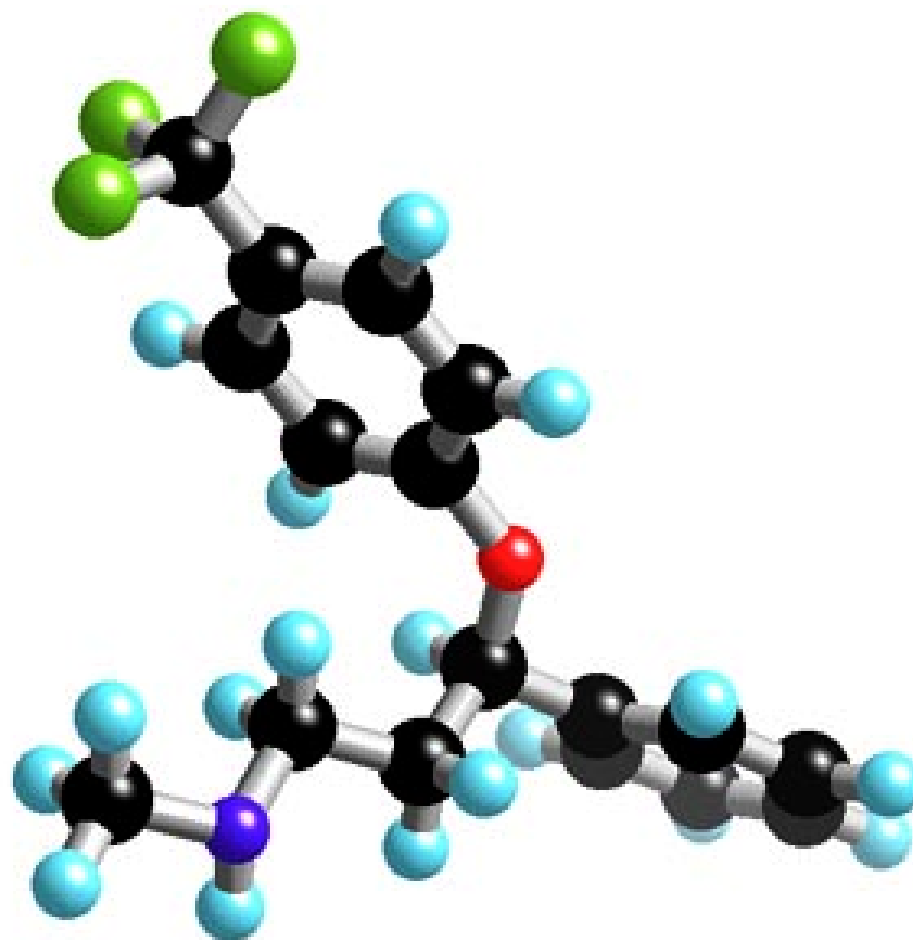
```
Out[4]:= - Graphics3D -
```

*The surface created by the implicit function  $\sin(x) + \sin(y) + \sin(z) = 0$ .*

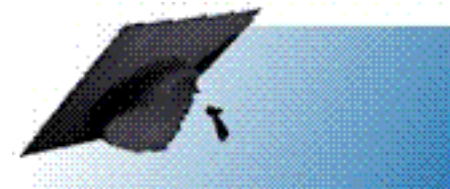
*Mathematica to visualise data*



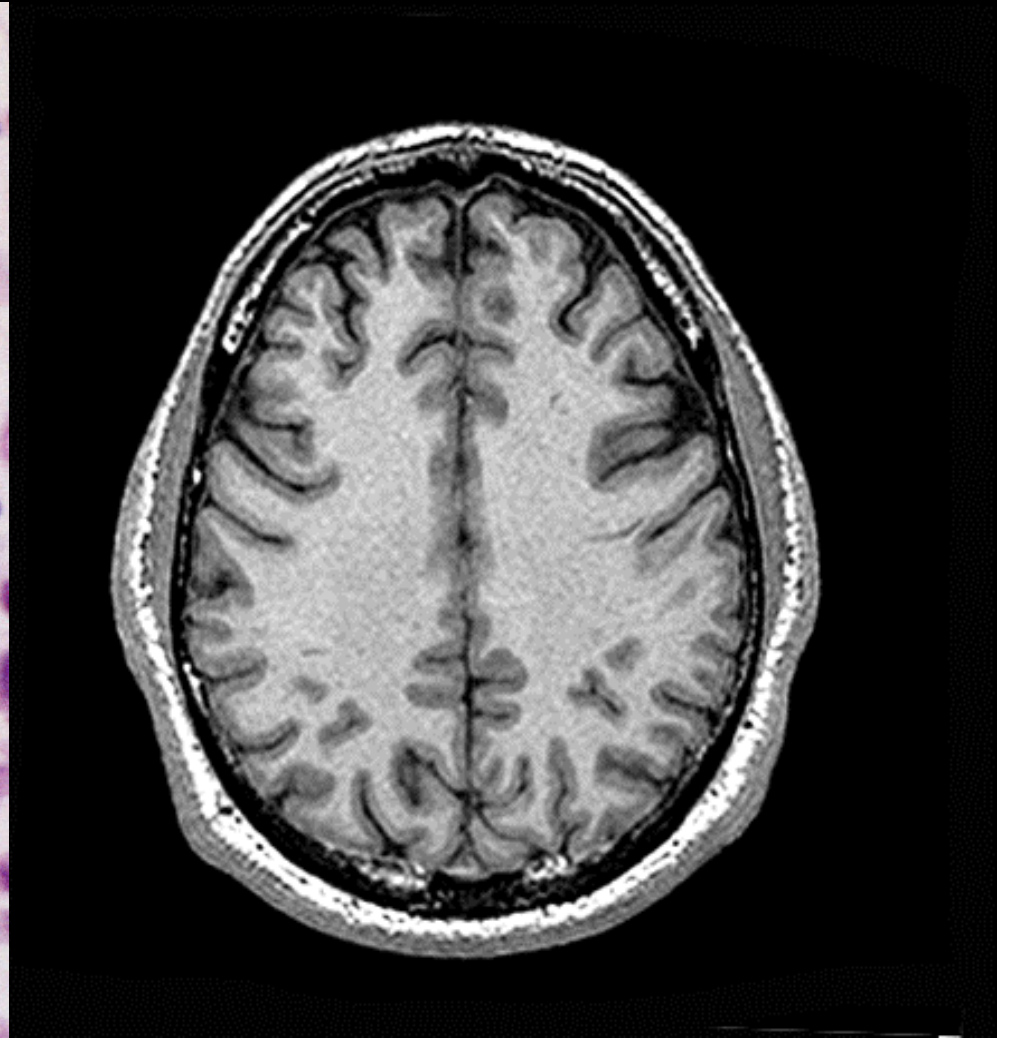
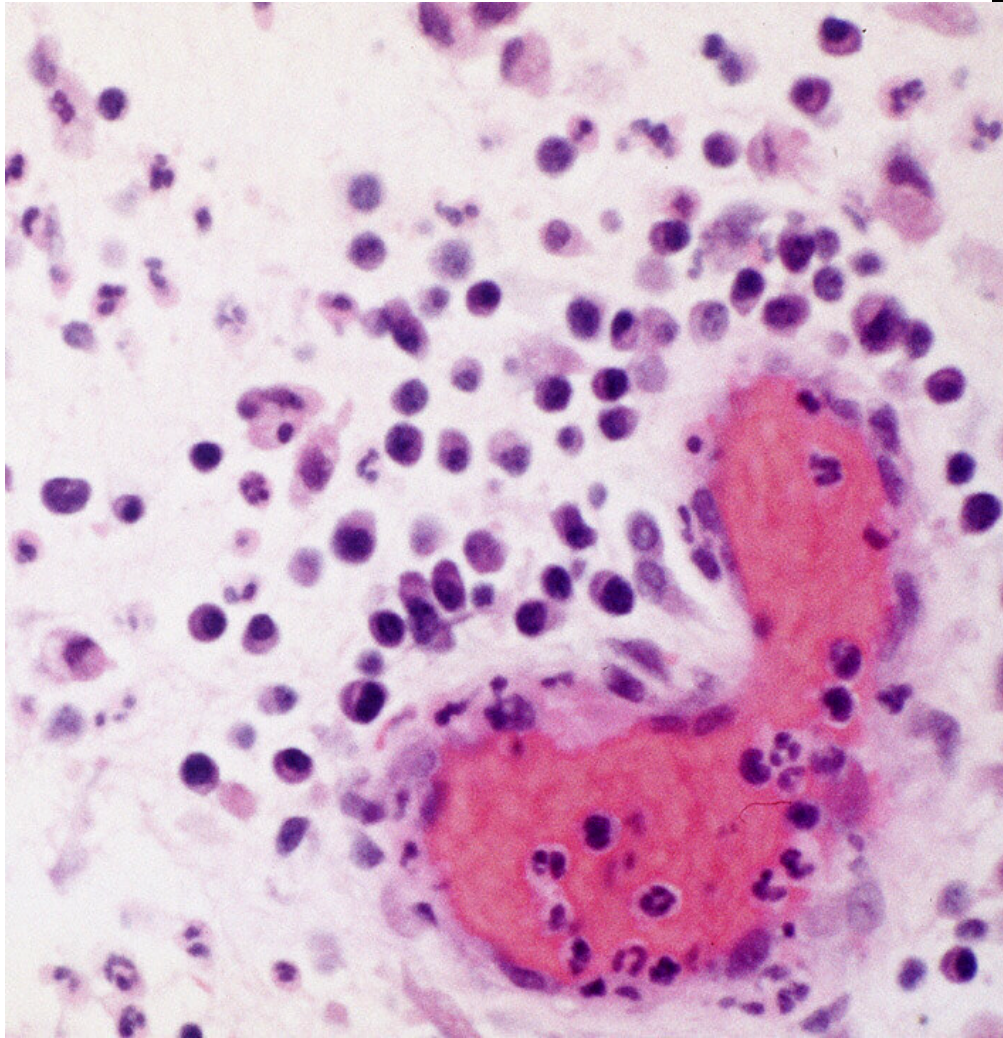
# Visualisation



*ChemDraw 3D in drug design*



# Visualisation

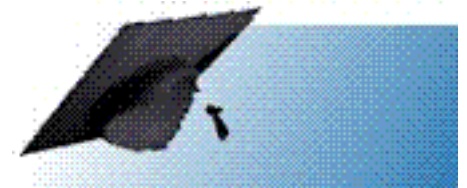


*Photoshop or NIH Image - histology or radiology images*



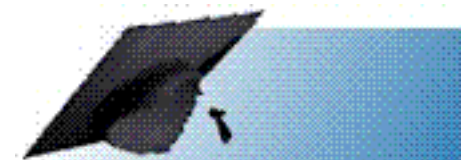
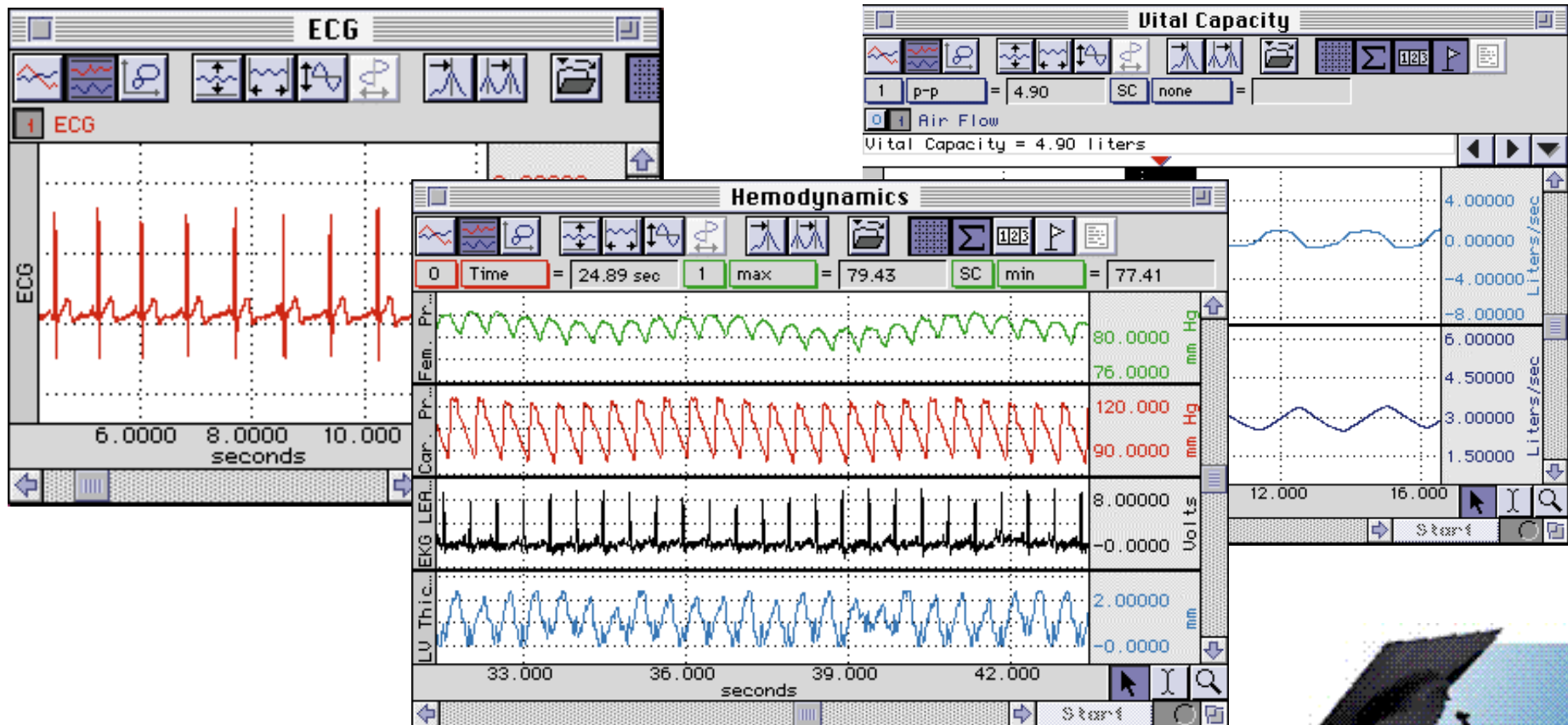
# Data Acquisition

- In “basic science” research & teaching
- In clinical research
- Any number of applications...



# Data Acquisition

- BioPac & AcqKnowledge software  
<http://www.biopac.com/>



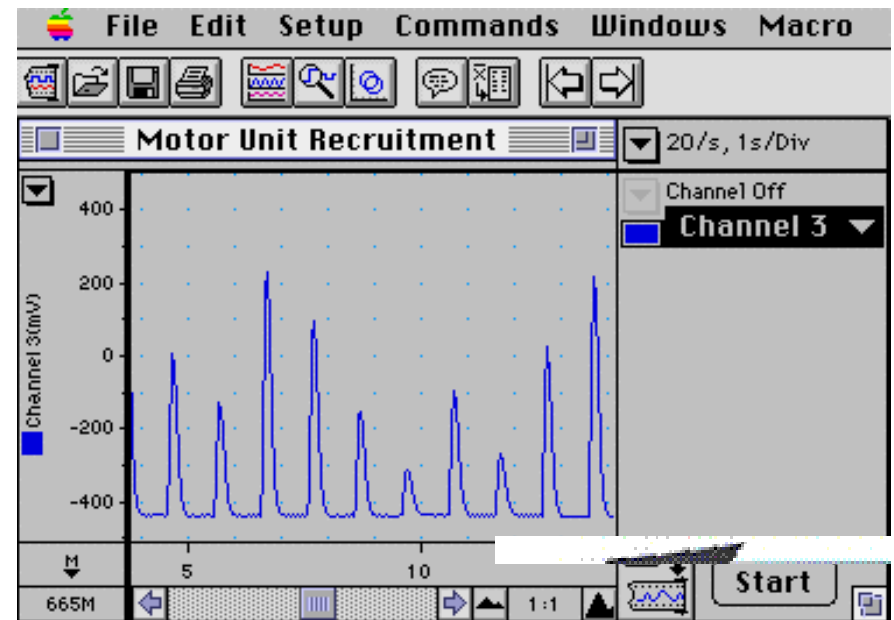
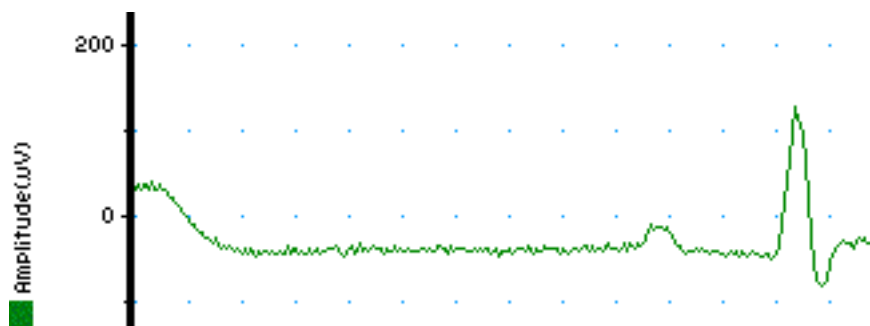
# Data Acquisition

- National Instruments & LabView software

<http://www.ni.com>

- But for a true Mac experience PowerLab & ADIs' software

<http://www.adinstruments.com/>

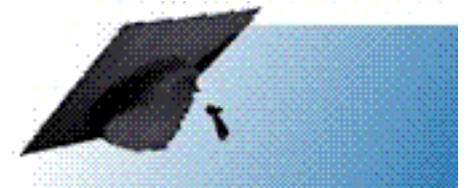


# Statistics

- Again, there are numerous applications-  
anywhere numbers are generated.

Epidemiology in clinical practice and evidence  
based medicine

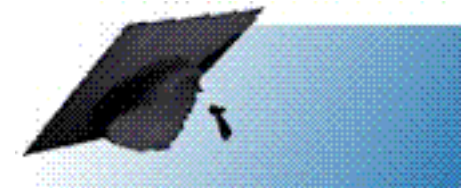
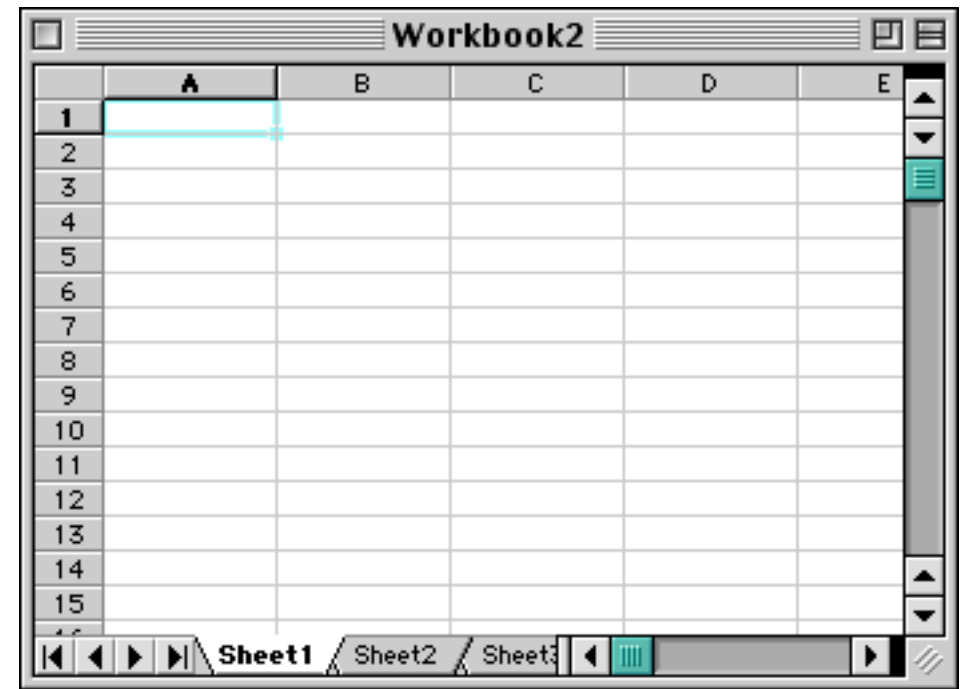
Basic science and clinical research



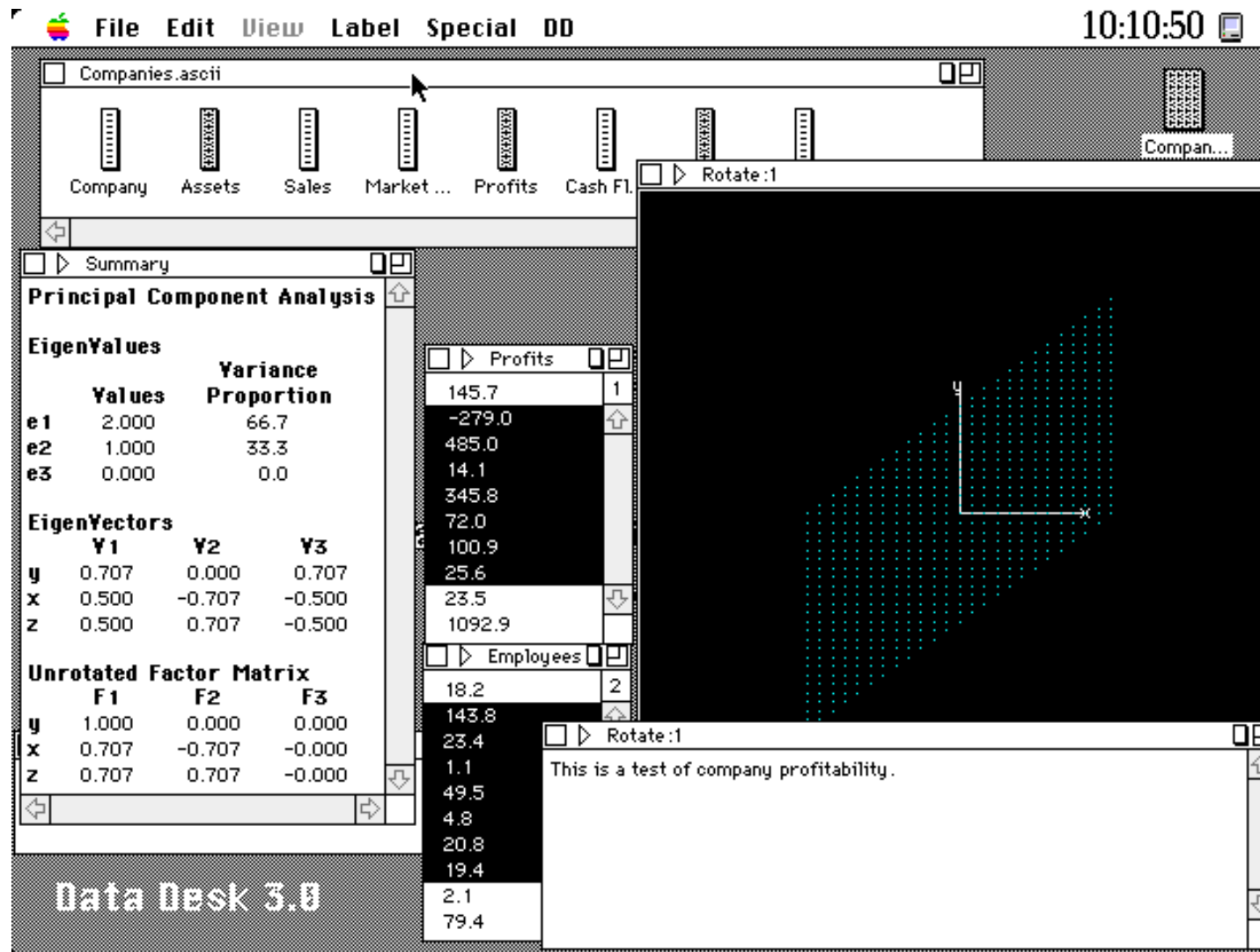
# Statistics

- Various applications available with the big news that SPSS is coming back to MacOS

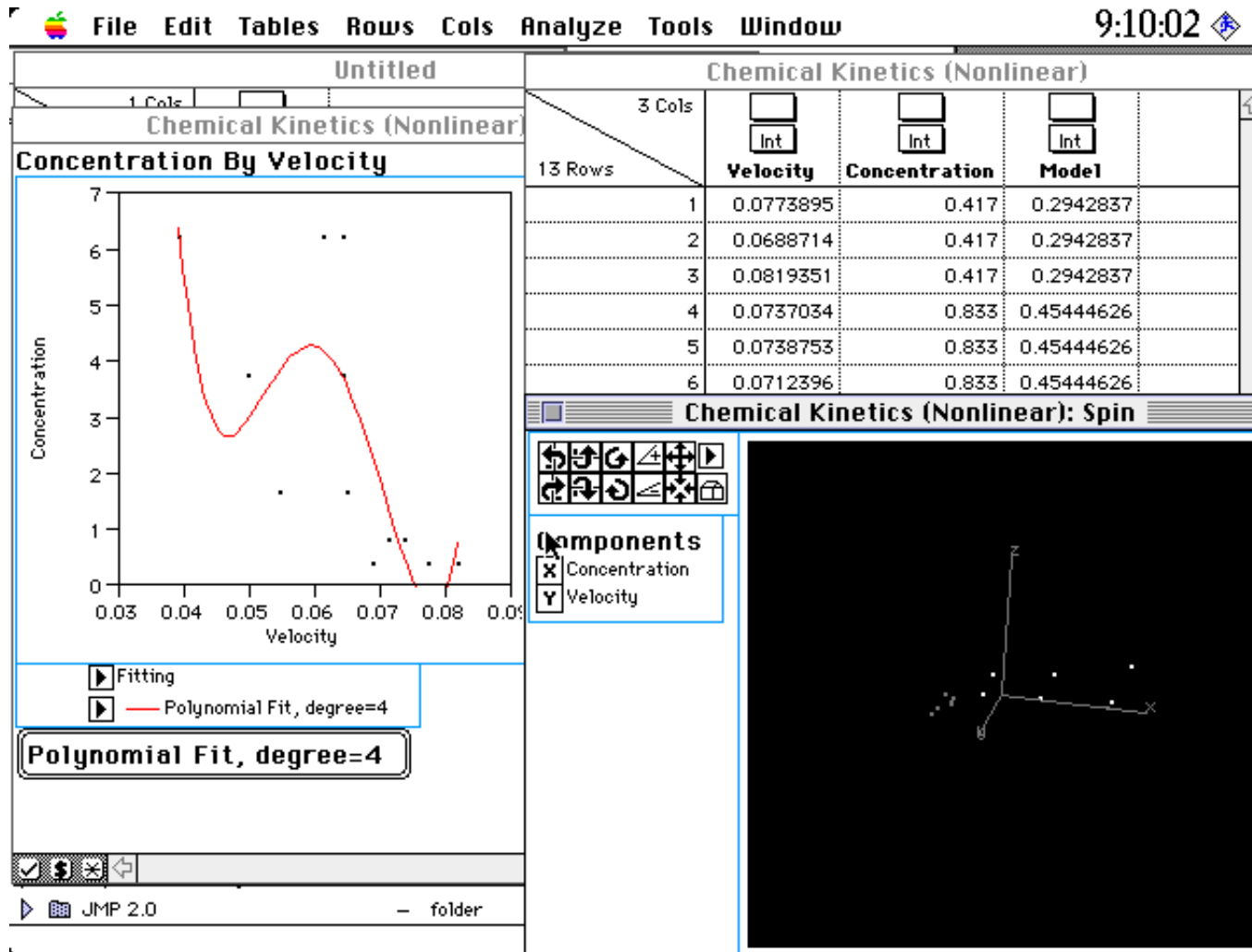
- Systat,
- Statview,
- SAS, Stata,
- Datadesk, Statistica
- Instat



# Statistics

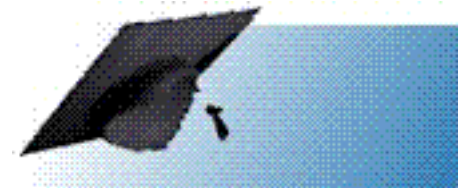


# Statistics



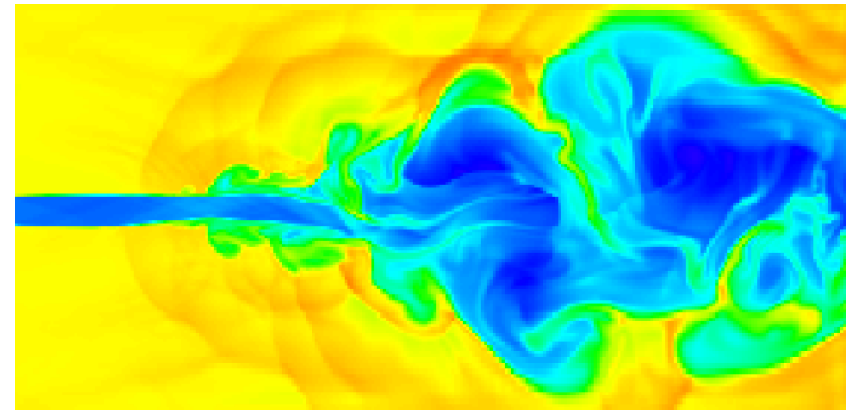
# Macintosh in Teaching

- Information
- Communication
- Distillation
- Presentation
- Assessment
- Life long learning



# Biological - Modelling

- data collection
- build a model
- run model
- refine model
- make predictions



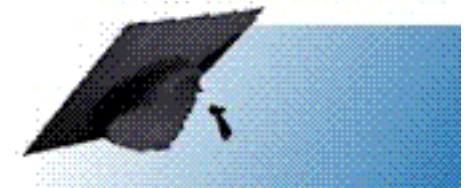
Hypodermic Injection - Fluid flow



Spyglass Transform



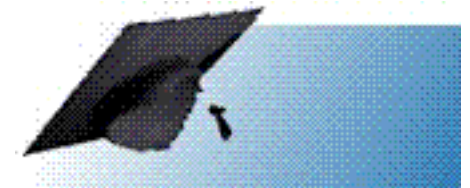
Matlab



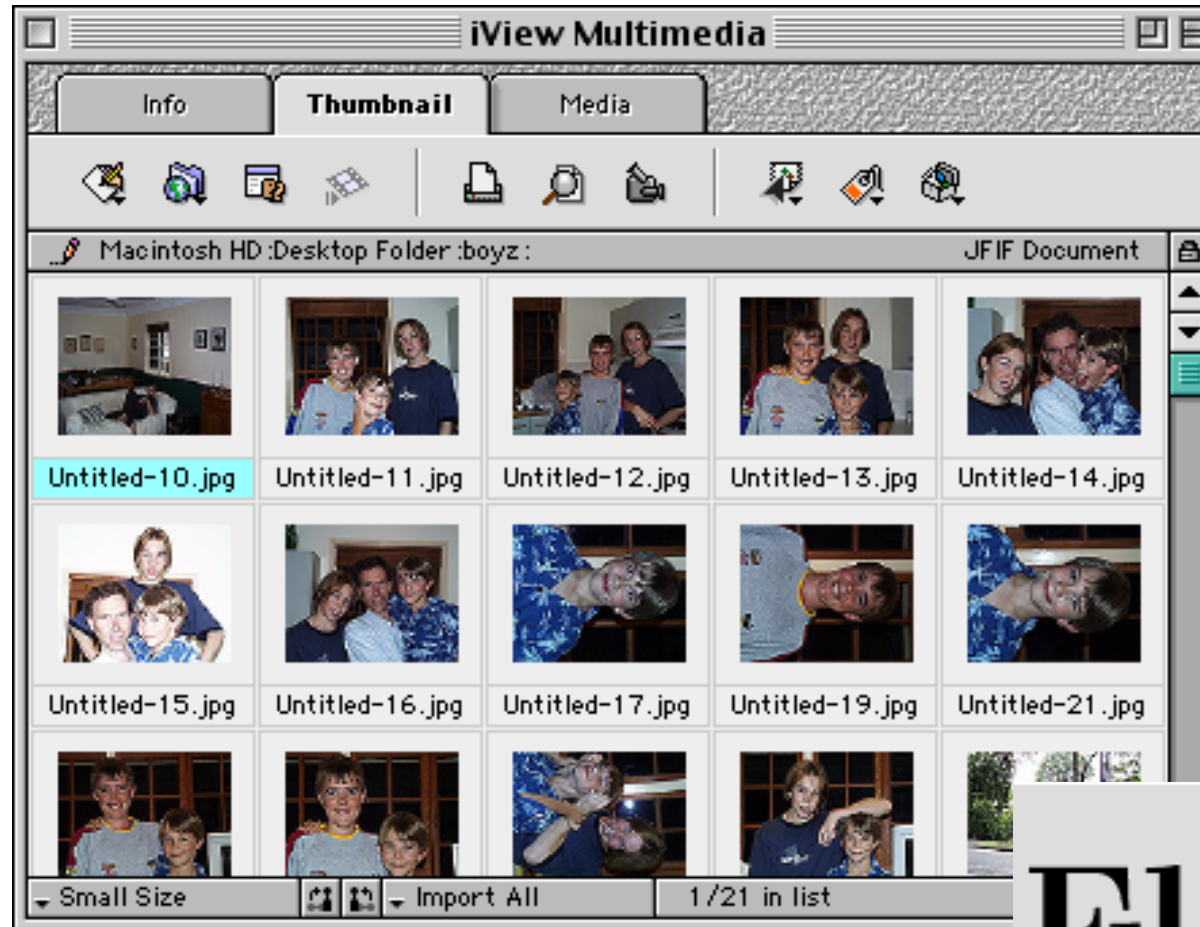
# CAL - Laboratories



- management
- content
- web browsing
- study “noise”
- games
- itutors
- iCam



# DataBases

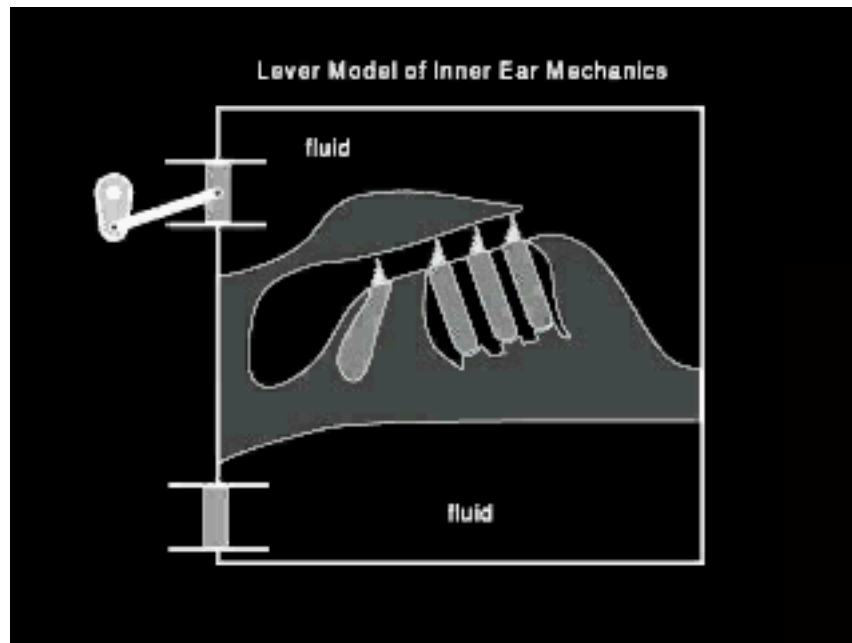


- biological images
- biological data
- web-based student feedback
- peer feedback

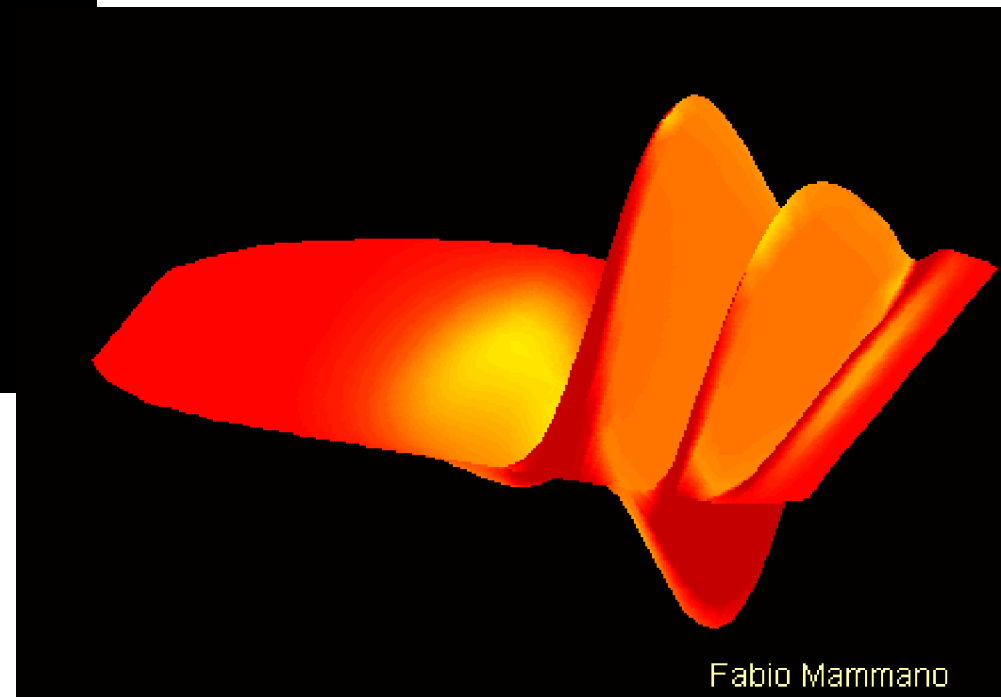
**FileMaker** PRO 4.1



# Lectures



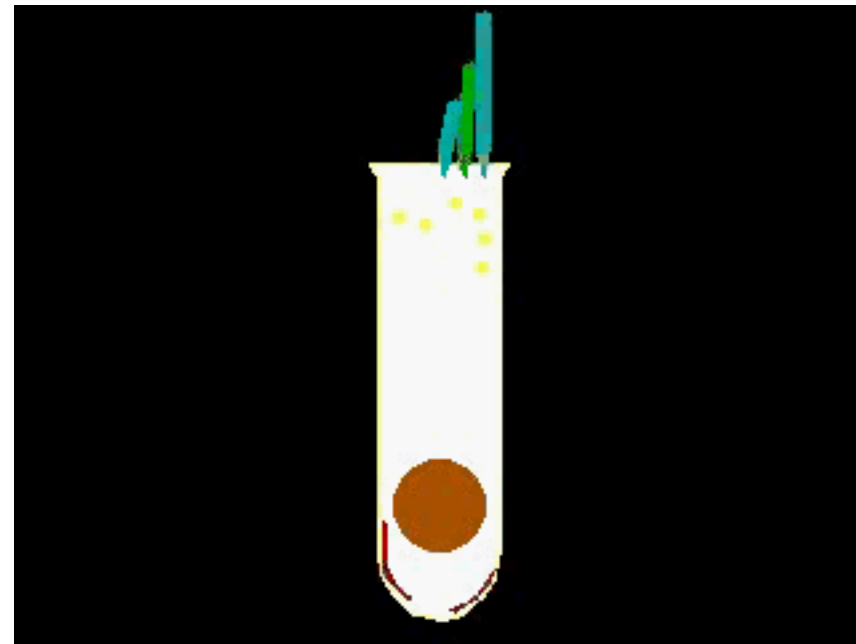
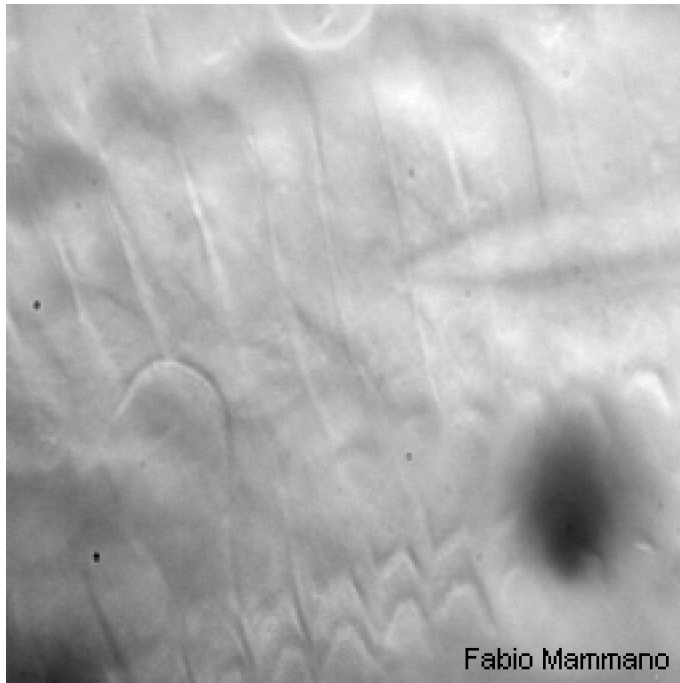
*“inside the ear”*



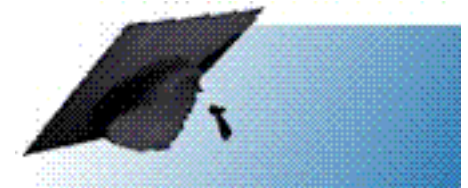
QuickTime playing avi movies

# Lectures II

*Use of real data and model data to demonstrate complex ideas*

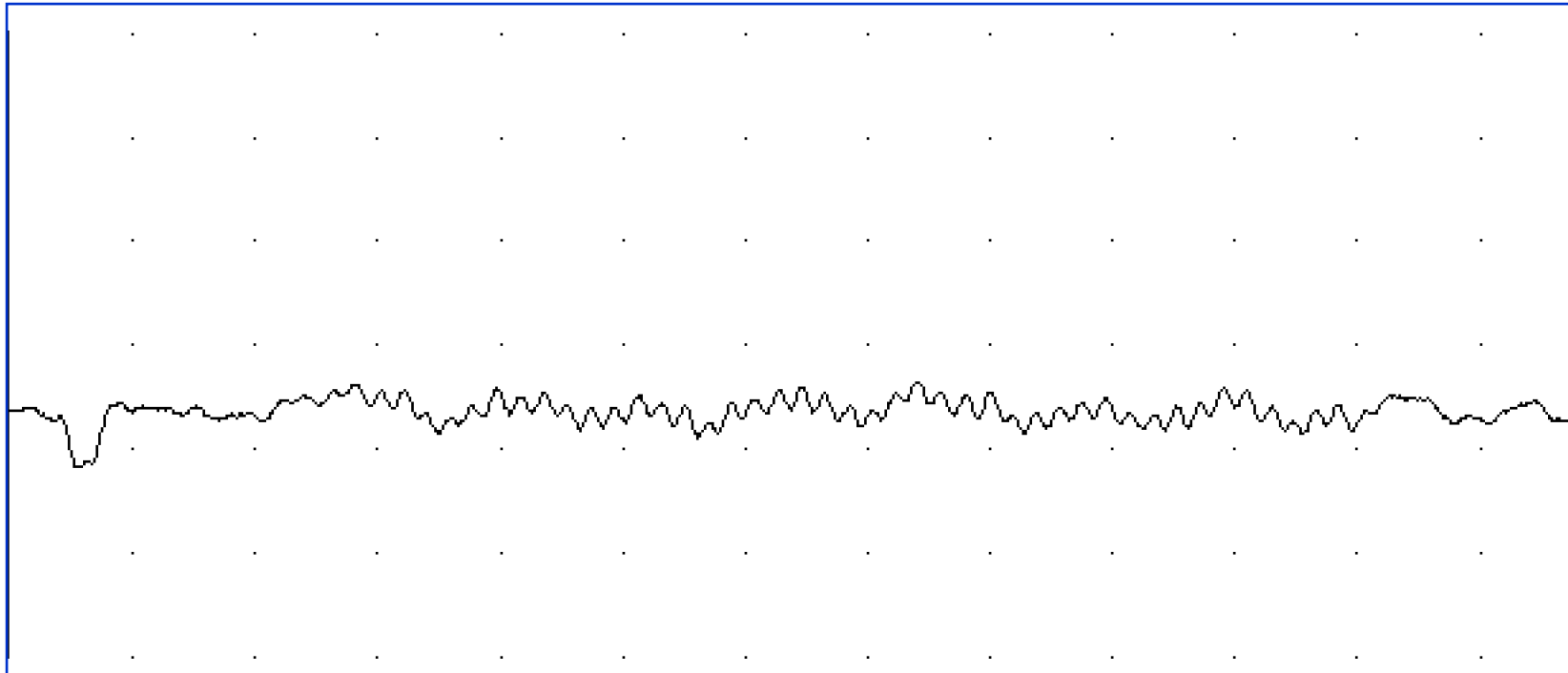


**QuickTime** playing avi movies

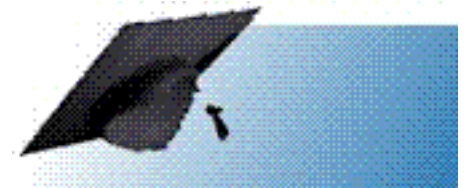


# Lectures III

*Son et lumiere*



Inner ear cell response  
to sound 525Hz



# Educational Assessment



[UQ Home](#) [Search](#) [Site Index](#) [Contacts](#) [FAQs](#) [Library](#)

You are here: [UQ Home](#) → [iHome](#) → iSurvey Form

**Staff:** Dr Alan Cody  
**Subject:** PL292 , Mammalian Physiology II  
**Year:** 1999  
**Semester:** 2  
**Teaching Components:** Lecture



Your opinion about this staff member's teaching is valuable feedback for him or her, since students can judge best how effective it is for promoting learning. Please read each of the statements below and check which is closest to your opinion about the staff member.

Your responses are anonymous.

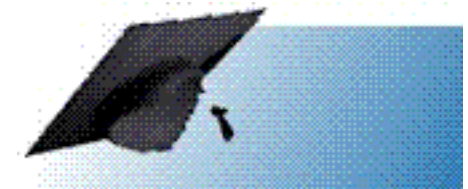
**Strongly Agree**   **Agree**   **Neutral**   **Disagree**   **Strongly Disagree**   **Not/Applicable**

## Section 1

	Select one option only					
	SA	A	N	D	SD	N/A
The lecturer produced classes that were well organised	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The lecturer presented material in an interesting way	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The lecturer gave explanations that were clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



- student evaluation
- peer comparison
- formative and summative learning

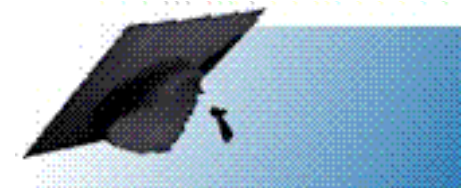


# Course Management



## *WEB CT*

- Student orientated
- One stop shop
- Staff facilitation



# Course Management

**Introduction to  
Operating Systems**

Welcome to CPSC 315

[Course Notes](#)  
bulletins

[Assignments](#)  
assignments

[Course Information](#)  
information

[You are using WebCT](#)

[Bulletin Board](#)  
bulletins

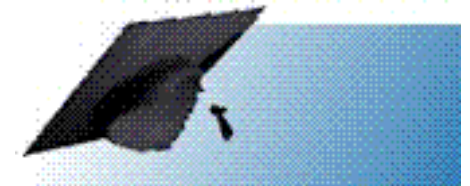
[On-Line Quizzes](#)  
quiz

[Student Functions](#)

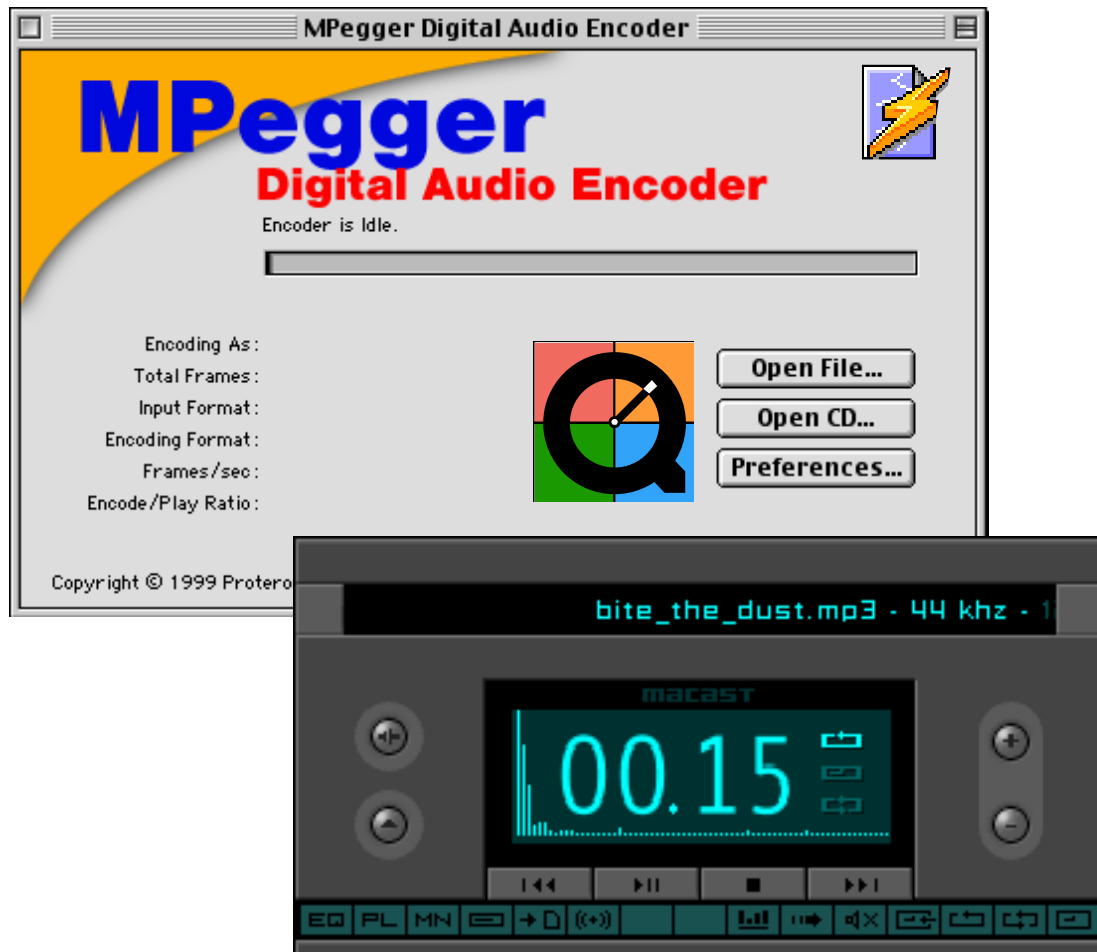
[E-Mail Within Course](#)  
mail

This Page Has Been Accessed **05749** Times

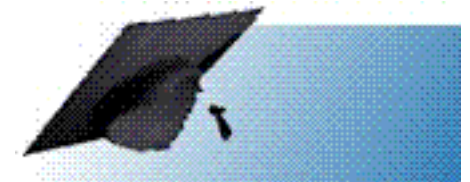
- Sophisticated
- Course specific
- Accessible
- Evolving



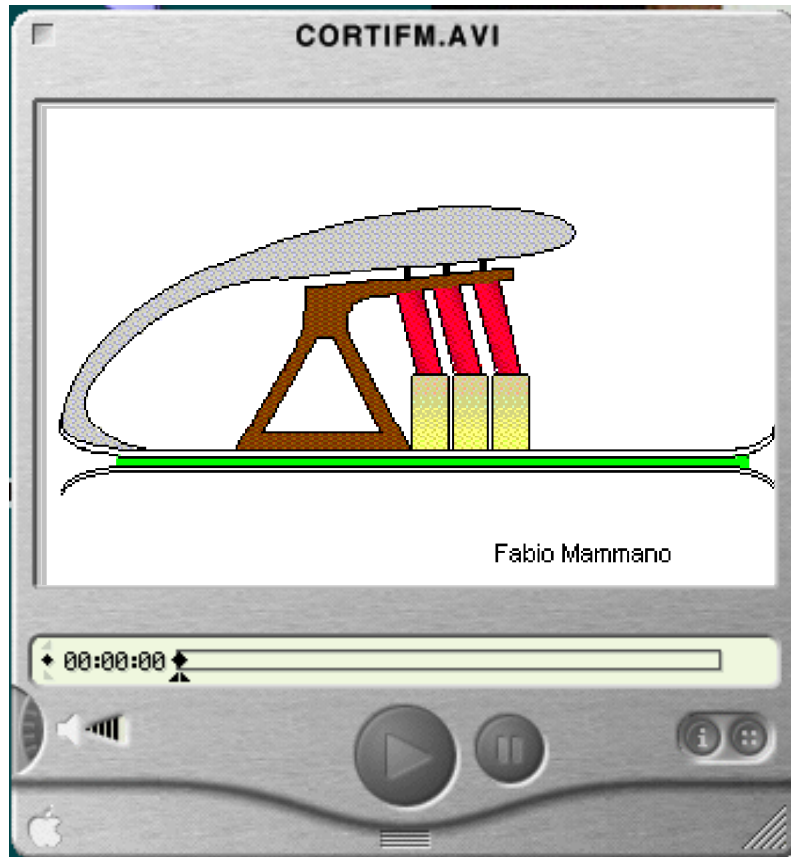
# Digital Audio



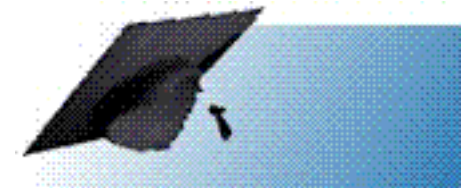
- Streaming audio
  - acoustics
  - talking books
  - help desk
- MP3
  - music (1M/min)
  - any acoustics



# Digital Video



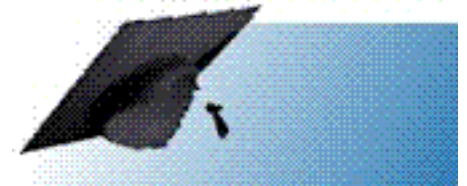
- streaming video
  - lectures, tutorials, slide shows
  - “real” data
- self contained video



# Future Grunt



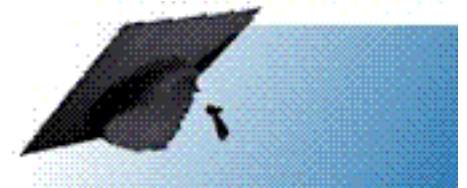
- rDE
- research tools
- virtual human



# Macintosh in Research



*Atherenborough on Molecular Biology*

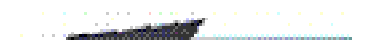


# Molecular Biology

# Macintosh in Research

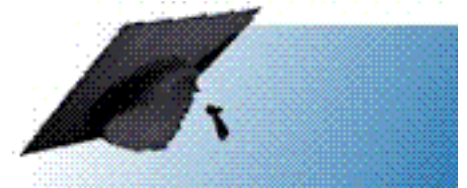


*Biochemistry*



# The tools used

- For image analysis *Photoshop* or *NIH Image*
- For data acquisition various tools. *PowerLab* and affiliated software most popular
- Most literature searches now via the web
- QuickTime a standard in animation & video with *Director*
- Often specialised hardware required- *Scion* card for example



# The tools used

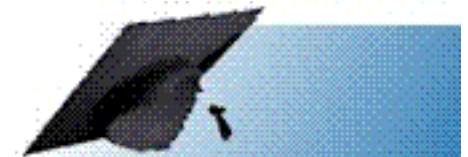
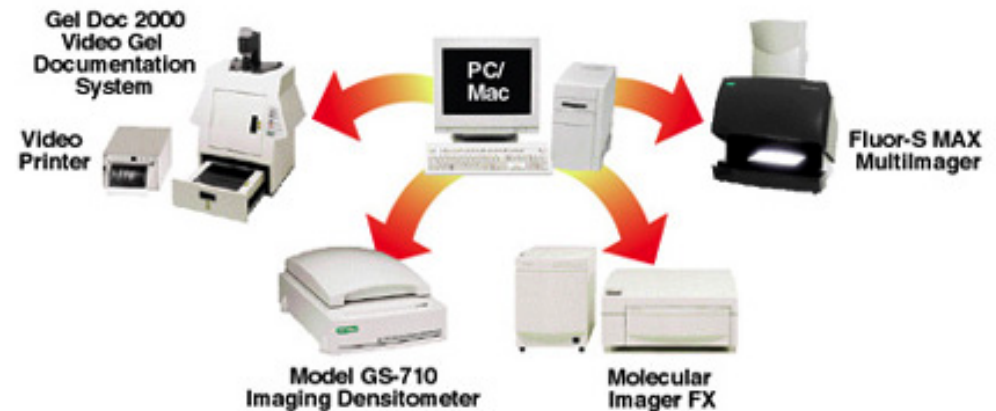
- BioRad and others have specialised tools ranging from microbiology to diagnostic tools  
<http://www.bio-rad.com>

Template: Microplate Photo												
	1	2	3	4	5	6	7	8	9	10	11	12
A	0	.5	1	5	10	20	50	100	U01	U01	U01	
B	10000	100	50	20	10	5	1	.5	0	U02	U02	U02
C	10000	0	.5	1	5	10	20	50	100	U03	U03	U03
D	X	U11	U11	U11	U12	U12	U12	U13	U13	U13	U14	U14
E	UR01	UR01	UR02	UR02	UR03	UR03	UR11	UR11	UR12	UR12	UR13	UR13
F	X1	X1	X1	X2	X2	X2	X3	X3	X3	X4	X4	X4
G												
H												

Transformations applied to this segment:  
1: @-#  
2: @  
3: @  
4: @

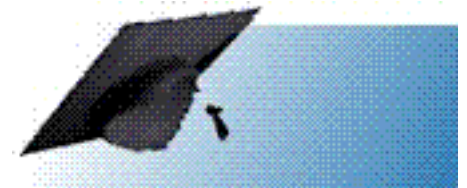
@: raw well value / result from new transformation  
#: blank  
loono: standa  
identifier: un

Seg



# Getting clinical

Zollie's video here....



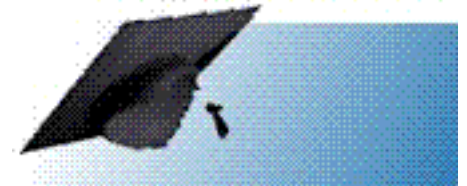
# Medical 4D Visualisation



QuickTime VR - Skull



QuickTime VR  
- renal artery



# Virtual Human Project



“to model  
ALL  
human  
physiological  
systems”

**Oak Ridge National Laboratory**  
*Bringing Science to Life*



# Virtual Human Models

## Revcor Functions Database Search

Please Choose a Cell Number  
for  
Animal 86095

86095-12	▲
86095-15	▬
86095-16	▬
86095-17	▬
86095-21	▼

Select Cell Number

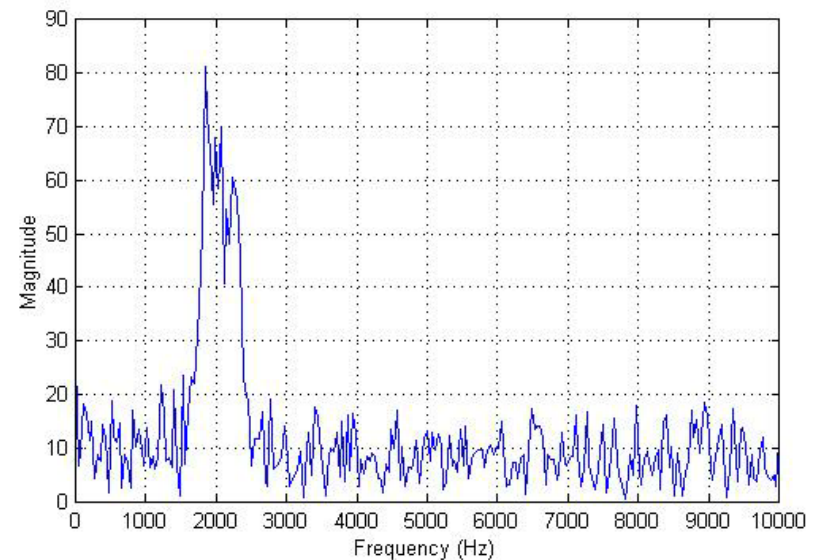


Spyglass Transform



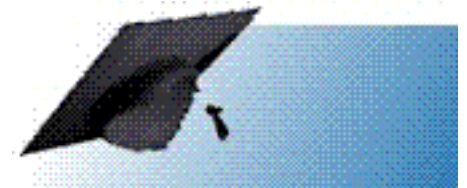
Matlab

## Data from Cell 86095-12 Characteristic Frequency 1875 Hz



info: Reverse Correlation Function

Let's visit some  
online resources



# AD Instruments

