

# Scientific Poster

SOS poster



1

## Examples

- CCMR Cornell Center for Materials Research  
(found at <http://hsp.berkeley.edu/sites/default/files/ScientificPosters.pdf> - accessed nov. 30 2015)
- <https://ps-spencer.posterous.com/perfect-posters>  
(accessed april 6, 2013)
- <https://www.utexas.edu/ugs/our/poster/samples>

2

# SOS Poster

## Avoid

- Paper on a poster format
- Too much text
  - Only the essentials
  - Remove unnecessary details
- Excess of color / combinations
- Intense background

## Ideal

- Be seductive
- Creative communication of research
- Clear structure (flow) of information
- Images and charts (visuals) instead of text
- Initiate communication
- Handouts can help



3

# Elsevier tips

## TIPS FOR DESIGNING BETTER RESEARCH POSTERS

Research posters are a common way to show the results of a project in the academic community. Researchers present posters at conferences as a way to communicate their work and may introduce their research to colleagues. However, it is not easy to achieve those goals when putting all your work in a layout. Here are some tips to help you design effective research posters that stand out.

### ► PREPARATION

Before creating your poster you should consider the following questions:

- What is your target audience?
- What is your main message?
- What does your viewer need to know?

Once you've decided on the main content, make a rough draft or storyboard with the information, tables and graphics you need.

### ► TEXT

Keep in mind that important information should be readable from about 2-3 metres away and avoid clutter from about five metres.

Use of bulletts, numbering, and headings, make it easy to read. If you want to add bulletts to section headings, better use a bolded, larger font for demarcating sections.

Avoid blocks of text longer than three lines.

Use a sans-serif font like Arial or Helvetica and keep size around 70 - 100 pts. subheads around 40 pts and body text around 24 pts.

Sometimes less is more, avoid any three-dimensional text or graphic.

### ► PRINTING AND PRESENTING

Save the file in a PDF format with the correct size. If possible print a draft first and double check for mistakes.

Consider preparing handouts of your poster.

References:  
<http://colorupright.com/tips/poster-design>  
[http://www2.mater.ac.uk/gov/writing\\_presentation/posters.html](http://www2.mater.ac.uk/gov/writing_presentation/posters.html)  
<http://goldeneye.rhul.ac.uk/~phylis/174875.htm#1471879>

### LAYOUT

Don't cram everything too tightly on one area.  
Aim for a word count of about 300 to 800 words.

Use 'negative' areas and create a grid to give your poster a clean, professional look.

Find a focal point that will help draw your viewers in.

### PHOTOS AND GRAPHICS

Use diagrams, graphs or flowcharts to help explain complex information visually.  
Keep after 1000x1000 pixels of graphics to text.

Keep in mind the resolution of your graphics, use at least images with a resolution larger than 300.

Images that look good online may not be high enough resolution to look good when you want them to be.

### COLOR

Try not to use too many different colors or gradients since this can distract.

Avoid using unnecessary and distracting background textures or decoration.

Use a plain and light color background, deep blues and dark reds are hard to read and produce posters that are too dark and difficult to read.

### SOFTWARE

Microsoft PowerPoint is the popular, easy-to-use software. However it is not the best option for poster design.

Adobe InDesign and LaTeX are the best options for text editing and layout but can be complex to use. Another option is Adobe Illustrator or Photoshop which are perfect for images and graphs.



4

## A poster is not a paper

The poster has a blue header bar with the KU LEUVEN logo. The main title 'My Poster is a paper' is in orange. Below it is a large block of black text. A small white paper airplane icon is positioned above the text.

5

## A poster is not a slide set

The poster has a blue header bar with the KU LEUVEN logo. The main title 'My Poster is a slide set' is in orange. Below it is a date '13/12/2012'. A grid of nine small slide thumbnails is displayed, each showing a different slide content. A small white paper airplane icon is positioned above the grid.

6

- A good example  
<http://ashkuff.com/blog/?p=18>



7

**Title of Poster**  
 Author's name, Author's name, Author's name  
 Name of Division, Department, Institution, City, State

**Introduction**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**Abstract**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**Data**

Category	Value 1	Value 2	Value 3	Value 4
Group A	10	12	15	18
Group B	12	14	16	20
Group C	15	18	20	22

**Method**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**Figures**

a) b)

**Captions of Figures**

**Results**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**Results continued**  
 In hac habitasse platea dictumst. Ut magna odio, vestibulum sit amet, ullamcorper nec, convallis eget, enim. Cras a libero. Duis eros risus, vehicula a, feugiat sit amet, venenatis aliquet.

**Conclusion**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**References**  
 Author, article, journal, page, date  
 Author, article, journal, page, date  
 Author, article, journal, page, date

**Title of Poster**  
 Author's name, Author's name, Author's name  
 Name of Division, Department, Institution, City, State

**Introduction**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**Abstract**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**Data**

Category	Value 1	Value 2	Value 3	Value 4
Group A	10	12	15	18
Group B	12	14	16	20
Group C	15	18	20	22

**Method**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**Figures**

a) b)

**Captions of Figures**

**Results**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**Results continued**  
 In hac habitasse platea dictumst. Ut magna odio, vestibulum sit amet, ullamcorper nec, convallis eget, enim. Cras a libero. Duis eros risus, vehicula a, feugiat sit amet, venenatis aliquet.

**Conclusion**  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent eu est ut orci sagittis fringilla.

**References**  
 Author, article, journal, page, date  
 Author, article, journal, page, date  
 Author, article, journal, page, date

8



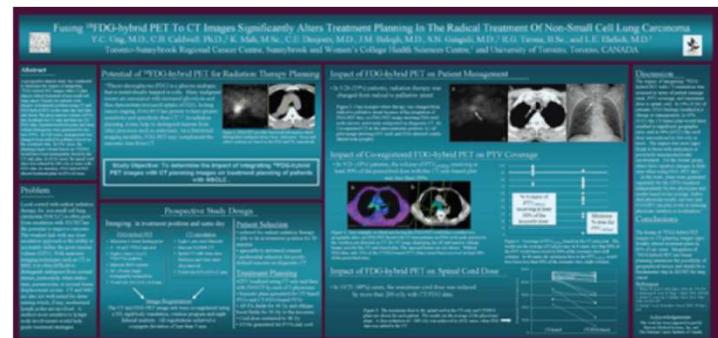
- Title too small
- Different text boxes do not form a unit
- Contrast between dark background and white text box is too intense
- Left part: too much text
- Clear title
- Large text box forms a unity
- Images aligned
- Pale colors are more eye friendly
- Balanced by spreading the image and the chart

<http://www.fes.uwaterloo.ca/computing/help/posterdesign/PosterCreation.pdf>



9

- Trop is Teveel
- exhausting

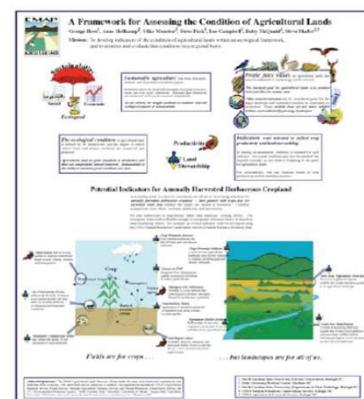


- Contrast
- Different backgrounds distract

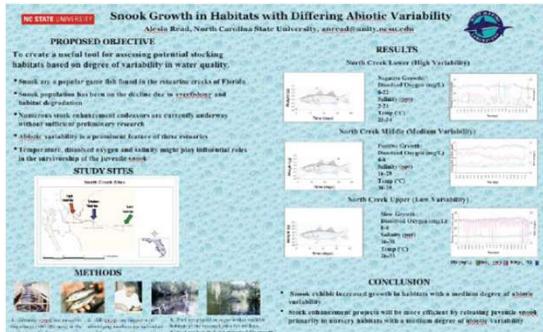


10

- Where to start?

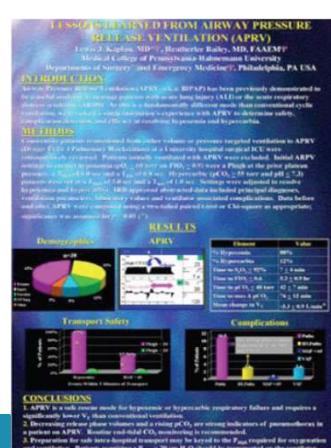
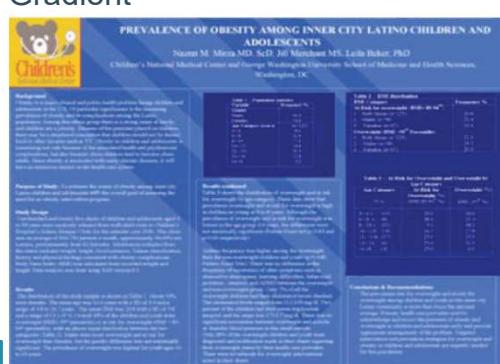


- Careful with standard PowerPoint background



11

- Dark background
- Contrast
- Gradient



12

• Use gradients sparingly

The image shows two scientific posters side-by-side. The poster on the left, titled 'Early Detection of the First MFT Consecutive Aggressivity Periods in the United States', is a complex collage of text, tables, graphs, and small images, appearing cluttered. The poster on the right, titled 'WHICH IS MORE IMPORTANT: NUMBER OF PATCHES OR CONNECTIVITY?', is organized into sections with clear headings ('INTRODUCTION AND OBJECTIVE', 'THE PROGRAM', 'RESULTS', 'CONCLUSION') and includes a flowchart, a graph, and a legend, appearing more structured.

13

• Color can help or not?

The image shows two scientific posters side-by-side. The poster on the left, titled 'Using a Windbreak Habitat Model Across Broad Landscapes: The Effect of Local Landscape Composition and Geographic Location', uses a blue-themed color palette and contains several small, low-resolution images and graphs. The poster on the right, also titled 'Using a Windbreak Habitat Model Across Broad Landscapes: The Effect of Local Landscape Composition and Geographic Location', uses a blue-themed color palette but features larger, higher-quality images and graphs, making the content appear more professional and visually appealing.

15

**Pilot Study - Tracking Session RPE TRIMP During an NCAA DI Men's Soccer Season with Special Emphasis on Practical Application**

Howard S. Gray, Satoshi Miyagawa, Michael D. Rasmussen, & Michael H. Stone  
Center of Excellence for Sport Science and Coach Education, KESS,  
East Tennessee State University, Johnson City, TN 37614

**Heads Above the Parapet: Midwifery Leadership Development**

Bernie Higgins  
Nottingham University Business School  
[www.nottingham.ac.uk](http://www.nottingham.ac.uk)

16

**A PROSPECTIVE, LONG TERM, RANDOMIZED COMPARISON OF THE BIPOLE PLASMA VAPORIZATION OF THE PROSTATE, MONOPOLAR AND BIPOLE RESECTION IN CASES OF AVERAGE SIZE PROSTATES**

Bogdan Gavrilete, Razvan Mihalescu, Florin Stanescu, Dragoș Georgescu, Marian Jocu, Cristian Moldoveanu, Petrușor Gavrilete  
Department of Urology, "Saint John" Emergency Clinical Hospital, Bucharest, Romania

**ABSTRACT**

**OBJECTIVES**

**METHODS**

**RESULTS**

**CONCLUSIONS**

17

**Inorganic Biochemistry of Iron Proteins**

Jared J. Heymann, Claire J. Parker Siburt, Katherine D. Weaver,  
and Alvin L. Crumbliss

Duke University – Department of Chemistry – Durham, NC

**Purpose:** To study iron protein biochemistry from the perspective of the iron

**Protein = Ligand**

**IRON PARADOX**  
Iron is needed for nearly every living cell  
Iron is toxic and can produce many different species & must be controlled

**IRON ABUNDANCE IN HUMANS**  
45-65 mg Fe in Humans  
70% in Hemoglobin (myoglobin)  
8.5% in Transferrin

**TRANSFERRIN**  
A mechanistic study of the iron release by receptor-bound transferrin using spectroelectrochemistry

**FERRIC BINDING PROTEIN**  
Role of a symmetric anion on modulating iron uptake in a bacterial transfer by pathogenic bacteria: A study in kinetics and thermodynamics

**HEMOGLOBIN**  
Proteins act as the 1<sup>st</sup> & 2<sup>nd</sup> coordination shell of iron and can modulate the kinetics and thermodynamics of reactions

**Techniques:**  
Spectroelectrochemistry  
UV-Visible Spectroscopy  
Fluorescence Spectroscopy  
Difference Spectroscopy  
Stopped-Flow Kinetics

**The Iron Paradox**  
Iron is needed for nearly every living cell  
Iron is toxic and can produce many different species & must be controlled

**Iron Abundance in Humans**  
45-65 mg in Humans  
70% in Hemoglobin (Myoglobin)  
8.5% in Transferrin

**Transferrin**  
Spectroelectrochemistry utilizes a short passage through the reduction potential range of the visible species as the analysis is limited by the availability of the sample. This is particularly relevant for a biological analysis because only a small sample volume is required.

**Optically Transparent Cell Layer Electrode**  
Heterogeneous reactions are complicated because the reaction may proceed at different rates depending on where the reaction occurs. This is particularly true for biological systems where the reaction may occur in the extracellular space or in the cytosol.

**Redox reactions are complicated because the reaction may proceed at different rates depending on where the reaction occurs. This is particularly true for biological systems where the reaction may occur in the extracellular space or in the cytosol.**

**Iron loaded Tf binds to the human receptor and is taken up by the cell. Tf is reduced to Fe<sup>2+</sup> and released into the extracellular space where the conditions are more reducing than the cytosol. The mechanism is unclear. The reduction potential of Tf is ~ -140 mV. Tf is reduced by biological reducing agents such as ascorbate and glutathione. Tf is also reduced by electron donors.**

**Structural Fe binding site similarity between Tf and FbpA**

**Fe<sup>3+</sup>FbpA-X → Fe<sup>2+</sup>FbpA-X**

**Fe<sup>3+</sup>FbpA-X + Y → Fe<sup>2+</sup>FbpA-Y + X-**

**3. Anion identity modulates both thermodynamics and reduction potential**

**Fe<sup>3+</sup>FbpA-X + Y → Fe<sup>2+</sup>FbpA-Y + X-**

**Iron transport can occur by a redox or non-redox mechanism in the presence of the anionic ligand. In the presence of the anionic ligand, Kinetically little exchange is possible in the dense anionic environment.**

**Hemoglobin, Myoglobin and Crumbliss, (2006) Unpublished**  
Heyman, Parker, Weaver, and Crumbliss, (2006) J. Biol. Chem. 280: 3050-10  
Roulic, Proux, Ovrigine, Weaver, Weaver, Crumbliss and Flanagan, (2004) Biochem. 43: 16707-74  
Dongue, Zaki, Zaki, Larive, Crumbliss and Aseen, (2006) Biochem. 43: 205-9

**Chemically modified Hb**  
-Pridoxalation  
-Pegylation  
-Crosslinking to polysaccharides & proteins

**-Intramolecular cross-linking**

**Combined Nernst Plot / Combined Hill Plot**

**E<sub>1/2</sub> vs Log P<sub>O<sub>2</sub></sub>**

**Implications**  
-Reducing power does not change.  
-Drive for activation not changed.  
-Structural modifications perturb the driving force of hemocyte.

**Oxygen Transport and Reduction Potentials**  
Modified Hb Conclusion  
Loss of cooperativity  
Lower oxygen affinity  
E<sub>1/2</sub> potential increased in Hbα<sub>2</sub>β<sub>2</sub> compared to Hbα<sub>2</sub>γ<sub>2</sub>  
Decreased tendency to form methemoglobin

**KU LEUVEN**

18

**MÉCANIQUE QUANTIQUE EN CHUTE LIBRE**  
Vers des mesures ultra-précises des mouvements

**I.C.E.**  
Interférométrie à source cohérente pour applications dans l'Espace

**INSTITUT d'OPTIQUE GRADUATE SCHOOL**

**ONERA**  
THE FRENCH AEROSPACE LAB

**l'Observatoire de Paris – SYRTE**  
Systèmes de Référence Temps Espace

**cnrs**  
CENTRE NATIONAL D'ÉTUDES SPATIALES

**Ondes et particules**

- Particules = boules de billard
- Ondes = vagues
- 2 particules au même endroit s'additionnent : On observe toujours 2 particules.
- 2 ondes interfèrent : La superposition d'ondes peut être nulle.

**Mesures Interferométriques**

On peut mesurer le décalage relatif acquis par les 2 ondes en regardant l'amplitude de leur interférence.

**Interferométrie atomique**

- Les atomes sont des très petites ondes à température ambiante.
- Mais quand on les refroidit :
- A très basses températures les atomes se comportent comme des ondes, on peut les utiliser en interférométrie.

**Accélérométrie atomique**

- Un nuage d'atomes est lâché en vol libre.
- On les sépare en deux paquets de vitesses initiales différentes par une impulsion laser.
- Deux autres impulsions lasers permettent de recombiner les paquets.
- Le décalage entre les deux trajectoires est par interférence.
- Cela permet de remonter à l'accélération du référentiel de l'expérience.

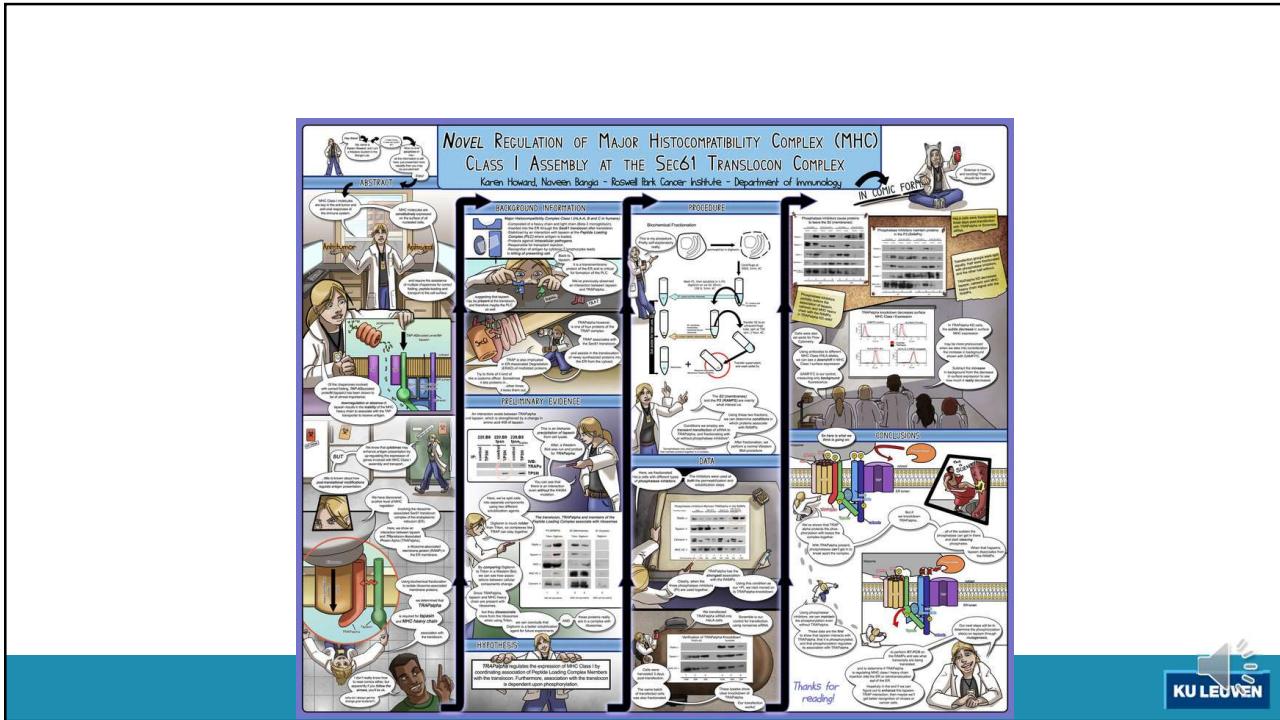
**Measures de mouvement par la chute de masses**

Pour mesurer l'accélération d'un avion, il suffit de regarder la chute d'un objet :

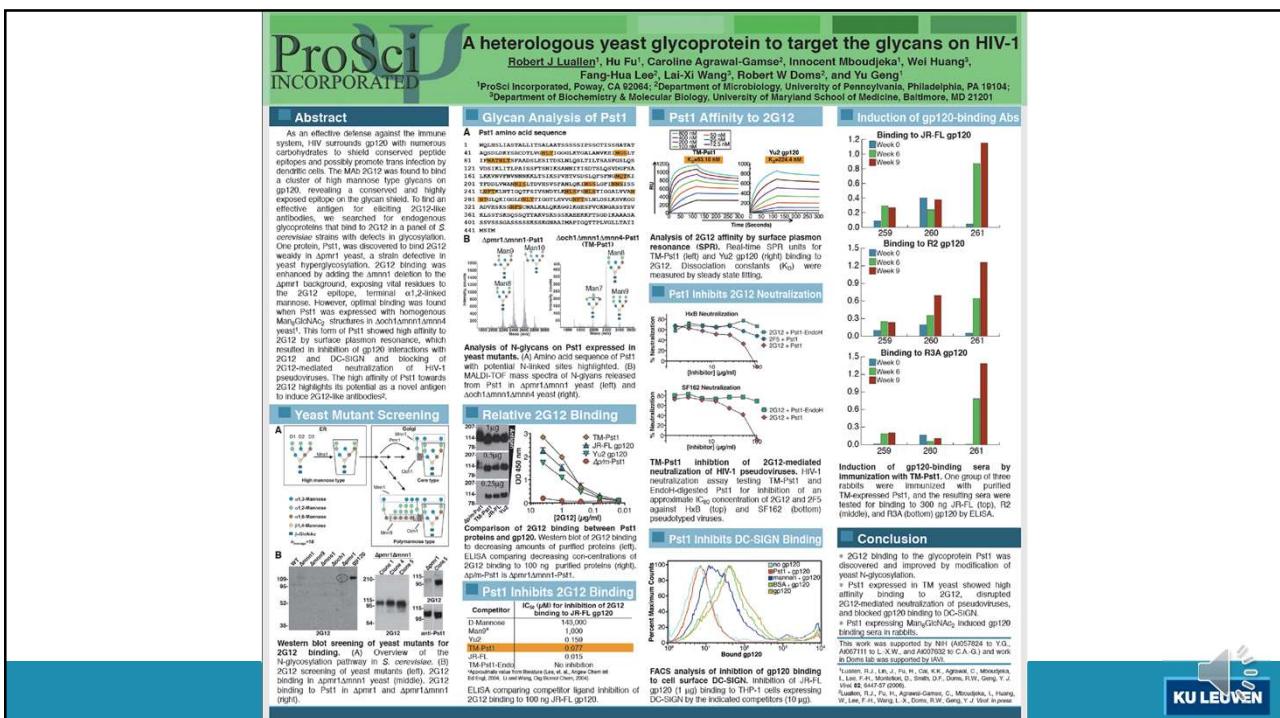
- Si l'objet semble immobile par rapport à l'avion, celui-ci chute avec l'accélération de la pesanteur.
- Si l'objet par la droite, l'avion tourne à gauche.
- Si l'objet chute avec l'accélération de la pesanteur, l'avion a une vitesse constante.

**KU LEUVEN**

19



20



21

## Molecular Nanomachines

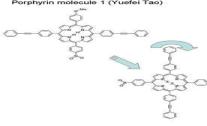
Lorenzo T. Flores, Matthew J. Comstock, Armen Kirakosian, Jongweon Cho, Michael P. Crommie  
Department of Physics, University of California, Berkeley

**Abstract**  

Using Scanning Tunneling Microscopy under UHV and functionalized porphyrin molecules, we have shown that porphyrin molecules are deposited on the Au(111) surface. In this case, the porphyrin molecule has a dipole moment, allowing them to be manipulated by applying a voltage between the tip and the sample. This accomplishment thus was first successfully deposit porphyrin molecules onto a metal surface. We also show how they orient themselves on the base lattice structure. After this is understood, we can begin to imagine the placement and ability of nanomachines can begin.

**Nanomachines**  

Different molecules and atoms, such as porphyrin and insulin, can act as nanomachines. We can use functionalized porphyrin molecules to mechanically manipulate. This would allow for complex patterned structures to be built. We can also use functionalized porphyrin molecules and atoms on a surface and investigate how they interact with each other. This will allow us to understand, research on manipulating the placement and ability of nanomachines can begin.



Porphyrin molecule 1 (Yuefei Tao)

**References**  

Lorenzo T. Flores, Matthew J. Comstock, Armen Kirakosian, Jongweon Cho, Michael P. Crommie  
Department of Physics, University of California, Berkeley

## Molecular Nanomachines

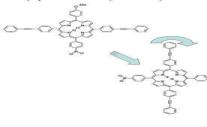
Lorenzo T. Flores, Matthew J. Comstock, Armen Kirakosian, Jongweon Cho, Michael P. Crommie  
Department of Physics, University of California, Berkeley

**Abstract**  

Using Scanning Tunneling Microscopy under UHV and functionalized porphyrin molecules, we have shown that porphyrin molecules are deposited on the Au(111) surface. In this case, the porphyrin molecule has a dipole moment, allowing them to be manipulated by applying a voltage between the tip and the sample. This accomplishment thus was first successfully deposit porphyrin molecules onto a metal surface. We also show how they orient themselves on the base lattice structure. After this is understood, we can begin to imagine the placement and ability of nanomachines can begin.

**Nanomachines**  

Different molecules and atoms, such as porphyrin and insulin, can act as nanomachines. We can use functionalized porphyrin molecules to mechanically manipulate. This would allow for complex patterned structures to be built. We can also use functionalized porphyrin molecules and atoms on a surface and investigate how they interact with each other. This will allow us to understand, research on manipulating the placement and ability of nanomachines can begin.



Porphyrin molecule 1 (Yuefei Tao)

**Materials and Methods**  

Scanning Tunneling Microscope (STM)

In order to view surfaces in the UHV environment, one for preparation, one for observation. A STM consists of two UHV UHV High Vacuum chambers.

Two UHV chambers housing an STM

Graphite for vibration damping

Cassette Used to hold sample

Magnets for easy sample changing

LeEDAES

STM

Crystalline

Load lock chamber

Preparation chamber

Tunneling current (0.5nA)

Applied Bias

Image corrected using plane and best-fit line subtraction

Possible porphyrin on Au(111) @ 2.75V, 0.5 nA and 138.3 X 135.3 Å²

Image corrected using offset and best fit line subtraction

Possible porphyrin on Au(111) @ 2.75V & 0.5 nA & 400 X 400 Å²

**Data Analysis**  

In ideal conditions, the image will appear flat with very fine detail. However, the STM is very sensitive and not all physical activity can be measured. For instance, if the sample is tilted at an angle there may be some artifacts in the image. This is why it is important for the software to be able to smooth transition from dark to light. My responsibility here is to make sure the software is able to do this accurately.

**Results**  

Work on nanomachines using functionalized porphyrin is still in its beginning stages. Preliminary data indicates that porphyrin tends to adsorb in herringbone corners as seen in the above figures. This next step would be to continue depositing porphyrin and viewing how it interacts with other molecules.

**Data Analysis**  

In ideal conditions, the image will appear flat with very fine detail. However, the STM is very sensitive and not all physical activity can be measured. For instance, if the sample is tilted at an angle there may be some artifacts in the image. This is why it is important for the software to be able to smooth transition from dark to light. My responsibility here is to make sure the software is able to do this accurately.

**Results**  

Work on nanomachines using functionalized porphyrin is still in its beginning stages. Preliminary data indicates that porphyrin tends to adsorb in herringbone corners as seen in the above figures. This next step would be to continue depositing porphyrin and viewing how it interacts with other molecules.



22



OREGON  
HEALTH & SCIENCE  
UNIVERSITY

## Persistent Pain in Assisted Living Facilities

C.A. Kemp, BSN, RN, BC; L.L. Miller, PhD, RN; H.M. Young, PhD, GNP, FAAN; S.K. Sikma, PhD, RN

**What We Learned**

**Older adults with persistent pain living in assisted living facilities are more likely to have fallen in the previous year and require assistance with mobility.**

**Background**

- Persistent pain is a common, debilitating condition among older adults regardless of residence<sup>1</sup>
- Assisted living facilities (ALFs) are the fastest growing segment of the senior housing market<sup>2</sup>

**Purpose & Aims**

- Compare demographic characteristics, cognitive status, ADL function, & number of falls in past year in the pain group & non-pain group
- Describe analgesic orders of the pain group

**Sample**

- 156 residents from the Medication Management in Assisted Living Facilities study (NINR R21 NR009102-01) participated in this study
- Pain group (n=92, 59%) vs. non-pain group (n=64, 41%)
- Pain group inclusion criteria:
  - Routine or PRN opioid analgesic order OR
  - Routine (>once daily) non-opioid analgesic order OR
  - Pain-related diagnosis (e.g., arthritis, sciatica, "knee pain")

**Methods**

- Secondary data analysis
- Cross-sectional, descriptive design

**Results**

Needs Help with ADL Function

ADL Function	Pain Group (n=92)	Non-Pain Group (n=64)
Bathing	61%	43%
Dressing	43%	32%
Feeding	14%	14%
Toileting	35%	27%
Medication	93%	63%

Chi-Square test: p < .05

Analgesic Orders

Analgesic Type	Percentage
Opioids	~55%
Non-opioids	~25%
Bath	~10%
No analgesic orders	~10%

Table 1a - Sample Characteristics, Categorical Variables

Characteristic	Pain Group (n=92)	Non-Pain Group (n=64)
Gender	Male: 14 (15%), Female: 78 (85%)	Male: 17 (27%), Female: 49 (72%)
Marital Status	Married: 89 (97%), Other: 2 (2%)	Married: 82 (87%), Other: 2 (3%)
Education	Less than high school: 24 (26%), High school: 65 (71%), Postsecondary: 1 (1%)	Less than high school: 26 (41%), High school: 51 (80%), Postsecondary: 3 (5%)
Employment	Full-time: 2 (2%), Part-time: 43 (47%), Not working: 47 (51%)	Full-time: 24 (38%), Part-time: 23 (36%), Not working: 17 (29%)
Health Insurance	Medicare: 41 (45%), Medicaid: 31 (34%), Private: 20 (22%)	Medicare: 46 (72%), Medicaid: 12 (19%), Private: 1 (9%)
Cognitive Status	Normal: 48 (53%), Impaired: 44 (47%)	Normal: 35 (54%), Impaired: 29 (46%)

Table 1b - Sample Characteristics, Continuous Variables

Characteristic	Pain group (n=92)	Non-pain group (n=64)	n	p-value
Age (years)	83 (7.8)	83 (6.6)	ns	
ADL Function score	1.7 (1.4)	1.6 (1.6)	ns	
Length of stay (months)	25.4 (22)	23.5 (18.3)	ns	

**Discussion**

- Prevalence of persistent pain in sample (59%) matches prevalence of persistent pain in other studies with older adults
- All residents required assistance with 1 to 2 ADLs on average; however, residents in the pain group required significantly more assistance with mobility
- 50% of residents in pain group fell in past year compared with 41% in non-pain group, although difference was not significant

**Next Steps**

- Examine correlations among falls, mobility, and analgesic orders in assisted living residents
- Describe changes in analgesic orders over 6-month period of parent study
- Examine impact of analgesic order changes on number of falls and assistance with mobility

**Limitations**

- Research questions formulated based on available data
- Data collected by chart review with minimal data verification
- Cross-sectional design prohibits analysis of changes over time or causal effect

**Acknowledgments**

NINR R21 NR009102-01  
John A. Hartford Building Academic Geriatric Nursing Capacity Pre-Doctoral Scholarship

23

**WHEN BAD THINGS HAPPEN TO OLDER PEOPLE:  
THE ROLE OF INTERVENING EVENTS ON THE DEVELOPMENT OF DISABILITY**

Thomas M Gill MD, Heather Allore PhD, Theodore R Hoford PhD, Zhenchao Guo PhD Yale University School of Medicine

**WHAT WE LEARNED**

Illnesses and injuries leading to either hospitalization or restricted activity represent important sources of disability for community-living older persons, *regardless* of the presence of physical frailty.

These intervening events may be suitable targets for the prevention of disability.

**BACKGROUND**

A more complete understanding of the disabling process would likely facilitate the development of interventions aimed at preventing disability among community-living older persons.

**OBJECTIVES**

To evaluate the relationship between intervening events and the development of disability

To determine whether this relationship is modified by the presence of physical frailty

**METHODS**

Prospective study of 754 nondisabled, community-living persons, aged 70+ years

Categorized participants into two groups according to the presence or absence of physical frailty, which was defined on the basis of slow gait speed

Followed participants with monthly telephone interviews for up to 5 years

- > to determine the occurrence of disability
- > to ascertain exposure to intervening events, which included illnesses and injuries leading to either hospitalization or restricted activity

**RESULTS**

Kaplan-Meier Curves for Development of Any Disability, Persistent Disability, and Severe Disability According to Presence of Physical Frailty at Baseline

Table 3. Association Between Proximate Intervening Events and Disability Outcomes According to Physical Frailty at Baseline

Proximate Intervening Event	Level of Baseline Physical Frailty	Any Disability	Persistent Disability	Severe Disability
Hospitalization	All participants	60	44	132
	Physically frail	34	32	93.2
	Not physically frail	117	73	281
Restricted activity only	All participants	5.1	3.3	7.3
	Physically frail	4.1	3.3	5.2
	Not physically frail	6.6	2.9	13

\*All values are statistically significant of  $P < .001$

**Table 1. Baseline Characteristics of Study Participants**

		Proximate Frail	No Frail
Characteristic	N	(n=445)	(n=309)
Characteristic	N	(%)	(%)
Gender, n (%)	265 (59.3)	85.4	59.1
Mean age, years	80.5 ± 4.7		
Non-Hispanic white, n (%)	366 (80.4)	80.0	79.9
Years of education, mean	12.3 ± 3.8		
Mean education, years	12.3 ± 2.8	11.3 ± 2.9	8.9 ± 2.9
Mean income, mean	\$15,811 ± 12,200		
Depression symptoms, n (%)	81 (18.1)	56.2	8.1
Depression symptoms, n (%)	81 (18.1)	56.2	8.1

**Table 4. Population Attributable Fractions**

Intervening Event	Any Disability	Persistent Disability	Severe Disability
Hospitalization	46	46	66
Restricted activity only	13	13	13

**Table 2. Factors Associated with Development of Any Disability**

Factor	Multivariate Hazard Ratio	95% CI	P
Age per each 5 years	1.1	1.03 to 1.18	.001
Female sex	1.1	0.9 to 1.4	.57
Non-Hispanic white	0.9	0.8 to 1.0	.74
Low income	1.3	1.0 to 1.6	.005
Years of education	1.0	0.9 to 1.0	.85
No college education	1.1	1.0 to 1.2	.04
Cognitive impairment	1.3	1.0 to 1.6	.07
Depression symptoms	1.3	1.0 to 1.7	.03
Hospital	2.2	1.8 to 2.7	.001
Proximate intervening events			
Hospitalization	60	46 to 76	
Restricted activity only	61	3.9 to 4.4	.001
Distant intervening events			
Hospitalization	10	0.9 to 11	
Restricted activity only	13	1.0 to 13	

**AMBULANCE**

**KU LEUVEN**

24

**Please Don't Measure My "Burden"  
Duty and Satisfaction Are What Matter to Me**

Lyda C. Arévalo-Flechas PhD, RN  
The University of Texas Health Science Center at San Antonio

**HGNI**  
Hartford Geriatric Nursing Initiative

**What We Learned & Where We Are Headed**

Measures for burden in the majority population may not assess the same concept in Latinos/Hispanics and other populations. The best measures of the impact of caregiving duties and the interventions to minimize negative effects may lie in concepts that express the impact more positively.

Duty fulfillment and satisfaction are proposed as positive perceptions of what Latino/Hispanic Alzheimer's caregivers experience. Further qualitative exploration of these concepts will provide the basis for instruments to measure these two types of caregiver perception not considered in current theoretical models.

**CULTURALLY INFORMED CONCEPTUAL ORIENTATION OF CAREGIVING**

**ANTECEDENTS**  
Regardless of social differences, a caregiver has day-to-day situations that are antecedents to coping and perception

**CONSEQUENCES**  
The resulting outcome is the perception that the caregiver has of the overall caregiving experience

**Realities of Caregiving → Coping → Perception of Caregiving**

**Background**

- Burden is not the best way to describe the impact of caregiving on Latino/Hispanic caregivers of a relative with Alzheimer's disease
- Current models do not consider the role culture and language play in how caregiving is perceived.
- Spanish lacks a word that translates to the English "burden." The Spanish word "carga" translates only to a physical load.
- Neither "burden" nor "carga" are culturally competent words to accurately describe Latino/Hispanic caregiving.

**Assumptions**

- Each culture gives people a way to see the world (Spradley, 1979). This worldview is passed from one generation to the next primarily through language.
- More than a way to communicate, language also creates and expresses our worldview (Spradley, 1979). Ways of perceiving, categorizing, and thinking about one's world result directly from one's language.
- The linguistic (cognitive) categories that make up one's reality and define actions and meanings (Krauss, 1990). Meaning is essential to our life (Frank, 1993). Meaning making allows us to make sense of our lives and experiences, as humans.

**CAREGIVER DUTY FULFILLMENT**  
Degree to which caregiver feels he or she is a dutiful caregiver and responsible for another.

**CAREGIVER SATISFACTION**  
Degree to which caregiver perceives balance between the changes made to care for another and areas of personal fulfillment.

**CAREGIVER BURDEN**  
Degree to which one perceives the inability to meet all of their responsibilities for another he or she is assisting.

**CULTURE AND LANGUAGE**

Research supported in part by the John A. Hartford Foundation Building Academic-Geriatric Nursing Capacity Program  
Special thanks to Asociación Colombiana de Alzheimer and the caregivers who participated in the study.

**KU LEUVEN**

25

**Abstract**

Material design by optimization is the casting of the discovery of materials with specific properties in terms of an optimization problem. The Nanoscience Problem Solving Environment, is a software development environment that includes the atomistic structure, electronic structure and optimization framework for the atomic-scale design of complex nanostructures and alloy (i.e. the forward problem) and do solving the inverse problem, i.e. the optimization of properties based on evolutionary algorithms. We present the NanoPSE software, which is a collection of tools for investigating the optimization of electronic structural properties of tetrapod-shaped CdSe nanocrystals for potential applications in surface passivating reagent potentials for electronic structure engineering of semiconductor materials. We present a comparison of semidefinitive methods and direct envelope for design of semiconductor alloys with specific electronic properties.

**Electronic Structure of Branched Tetrapod Nanocrystals**

Branched tetrapod nanocrystals are composed of four branched CdSe/CdTe materials [1]. Electrons from the conduction band (CB) and holes from the valence band (VB) can locate within regions of the valence band. This creates a variety of electronic structure effects, such as band offset differences between bulk cubic zinc-finger and branched tetrapod [2] materials and quantum confinement effects [3]. In this work we have understood and design nanocrystal geometries with tunable size and shape change localization. Our initial investigation focuses on branched tetrapods having cube, core-dot and hexagonal structures.

The atomistic model of a nanocrystal is generated by the IBS solvers. A few of generated models are shown below. The model of a branched tetrapod sheet contains 650 atoms in 13 unit cells and 2 long rods. The electronic structure calculation is done with the IBS solvers. The unit cell of 24 x 24 x 24 FCC supercell model was used for the electronic structure calculation was run on NREL's lesser Linux cluster typically with 32 processor cores and robustness with respect to the number of bands and effective masses.

**MDO Material Design by Optimization**

MDO material design by optimization, is the casting of the discovery of materials with specific properties in terms of an optimization problem. This includes combining the forward problem of optimization such that atomic configurations can be found to be physically realizable.

The Inverse Band Structure (IBS) problem [4] is to find the best atomic configuration of a given type of semiconductor alloy with desired electronic band structure.

IBS solvers based on genetic algorithm (GA), scatter search (SS) and direct search (DS) [5] and inverse method for alloys using genetic algorithm (GA) [6] and scatter search (SS) [6] optimization methods were used for the electronic structure optimization of the branched tetrapod nanocrystal. We are interested in the effect of electronic structure varying the sizes of coordination number and rods of branched tetrapod structures.

**Surface Passivation by Optimization**

The calculation of the electronic properties of the branched tetrapod will take no account surface effects [8]. We have developed a method of automatically defining the boundary conditions of materials within the context of the empirical pseudopotential theory. This approach generates the pseudopotentials for these periodic boundary conditions, so that the surface states near the band edges. The calculation of the electronic properties of the branched tetrapod will take no account surface effects [8]. We have developed a method of automatically defining the boundary conditions of materials within the context of the empirical pseudopotential theory. This approach generates the pseudopotentials for these periodic boundary conditions, so that the surface states near the band edges.

**Acknowledgement**

Collaborators: Alex Zunger, Jack Dongarra, Gabriel Bester, Alberto Franciosetti, Julian Langford, Victor Eljhout, Andrew Canning, Onni Marques, Steve Rumsby, and others.

Funding Supported by the DOE - Office of Science - Office of the Advanced Scientific Computing Research - Mathematical, Information, and Computing Division, and the National Energy Research Scientific Computing Center (NERSC) Modeling in Nanoscience Initiative under Contract No. DE-AC36-99GO10337.

Computing resources at NERSC, which is supported by US DOE SC under Contract No. DE-AC03-76SF0098 and at NREL Computational Sciences Center.

26

## Adapting Five Key Social Instruction Strategies to the CS Educational Environment

**WHY SOCIAL INSTRUCTION?**

Social instruction addresses the changing needs of CS and STEM students in an economy driven by rapid technological innovation. Globalization and information and interaction are now transmitted at a rate beyond the capability of individual learners; globalization has led to more and more diversity in the classroom and the workplace.

To prepare students for these demands, CS and STEM curricula have shifted away from a "lone ranger" approach to learning to a collaborative, holistic and interdisciplinary learning models which leverage teams' collective brainpower, strengths and expertise while fostering and valuing diversity. The more complex the activity, the more team skills are required by the participants. Social learning strategies are key to addressing the demands of 21st-century CS and STEM education.

**CHALLENGE**

Making diversity issues concrete and relevant for all students, not just students from underrepresented populations

**SOLUTION**

Mock hiring exercise where identical resumes are presented to students with female and male names, providing an opportunity for discussing conscious and unconscious bias (Cited VanDeGrift at ICER 2008)

**LEGITIMIZATION**

Explicitly valuing diversity to support retention of women and other underrepresented groups

**RECIPROCAL LEARNING**

Empowering students to explain their learning to other students

**COLLABORATIVE LEARNING**

Workshop-solving and team environments that explicitly rely on interdependence

**GUIDED INSTRUCTION**

Gradually reducing scaffolding of the student learning process

**ACTIVE LEARNING**

Strategic, self-conscious, self-motivated, and purposeful learning

**CHALLENGE**

Concerns about some students "freeloading" off others

**SOLUTION**

In pair programming, students alternate frequently between clearly specified, mutually dependent roles: driver and navigator.

**CHALLENGE**

Too much content to cover to have time for in-class exercises

**SOLUTION**

Quick ways like "What was the clearest idea?" and the "muddiest" point reinforce learning and allow unclear ideas to be addressed before attempting new material.

**CHALLENGE**

scaffolding = spoon-feeding

**SOLUTION**

For novice programmers, completing a program instead of facing a blank file can facilitate early success and a focus on code function.

Denise Wilson, Ken Yasuhara, Ryan Campbell • University of Washington  
Rebecca Bates, Rachel Sear • Minnesota State University Mankato  
Elaine Scott • Seattle Pacific University

**ACKNOWLEDGEMENT**

University of Washington, University of Minnesota, Seattle Pacific University, and the National Science Foundation.

**NSF**

**KU LEUVEN**

27

**Abstract**

The Isle of Arran, known as "Scotland in Miniature", is located in the Firth of Clyde off the West Coast. Geologically, the isle is diverse and the light-colored sandstone leaving the northern half of the island has been used by people with marginal farming areas<sup>1</sup> as "adverse change on the landscape". The construction of farmhouses, roads, fencing, dykes, out-buildings, bothies, pigsties, barns, etc., have a profound effect on the environment and landscape.

Eighteenth and early nineteenth-century agricultural practices were conducted in a communal society that used traditional methods that used two types of planting methods, lazy beds and run-rigs.

**Conclusion**

Today the landscape has lost riparian zones, soil, and nutrients, while experiencing significant changes in hydrological patterns that have affected the flora on the island. The Age of Enlightenment "Improvement" has changed the landscapes of Arran farms, creating a few larger units with marginal farming areas. Sheep and deer grazing which further altered the landscape.

**Abstract**

The Isle of Arran, known as "Scotland in Miniature", is located in the Firth of Clyde off the West Coast. Geologically, the isle is diverse and the light-colored sandstone leaving the northern half of the island has been used by people with marginal farming areas<sup>1</sup> as "adverse change on the landscape". The construction of farmhouses, roads, fencing, dykes, out-buildings, bothies, pigsties, barns, etc., have a profound effect on the environment and landscape.

Eighteenth and early nineteenth-century agricultural practices were conducted in a communal society that used traditional methods that used two types of planting methods, lazy beds and run-rigs.

**Conclusion**

Today the landscape has lost riparian zones, soil, and nutrients, while experiencing significant changes in hydrological patterns that have affected the flora on the island. The Age of Enlightenment "Improvement" has changed the landscapes of Arran farms, creating a few larger units with marginal farming areas. Sheep and deer grazing which further altered the landscape.

**LAND AND MAN  
The Effects of Eighteenth & Nineteenth Century  
Agriculture on the Northern Half of the Scottish Isle of Arran**

**BY CHRISTINA MILLEN GRAVATT**  
ENVS 499 April 24, 2006  
Advisor: Dr. Yvette Bordeaux

28

# A Life of Quality?

Tara L. Nickle, MSW  
University at Albany, SUNY  
[ln7719@albany.edu](mailto:ln7719@albany.edu)

Systematic review and meta-analysis of interventions relevant to quality of life for persons with intellectual disabilities and dementia

**Background**

Shifts in population, life expectancy, and associated prevalence rates have brought attention to services for persons with intellectual disabilities (ID) and dementia, which are ill-prepared to meet growing needs.

**Aim**

Synthesis of ID literature in order to assess: 1) the effectiveness of psychosocial interventions with QOL-related outcomes, and 2) their relevance for persons who are aging with dementia.

**Methods**

Use of a QOL conceptual framework with targeted domains/indicators (Schlock & Verdugo, 2002). Electronic and hand searches to uncover published studies spanning 25 years from databases, journals, conference proceedings, reference lists, etc. Study selection, quality assessment, and data abstraction undertaken by two independent reviewers. Narrative synthesis of studies and fixed/random effects meta-analyses by classified QOL domain.

**Key QOL Domains**

A dissertation funded by the John A. Hartford Doctoral Fellows Program in Geriatric Social Work, Administered by the Gerontological Society of America

29

**Research in the Polar Regions**

The Arctic and Antarctica hold interest for many types of researchers. For example, glaciologists study the ice and snow, while oceanographers look at the oceans. The ice, snow, and oceans in the Arctic and Antarctica are changing as a result of global warming and affect the global climate. Biologists research the plants and animals, which are severely affected by the polar regions warming and melting. Researchers study the environment, which is changing rapidly. Researchers study the economics and policies influencing the polar regions, and the people of the Arctic, who are being affected by environmental changes. Other types of researchers who work in the polar regions include geologists, geographers, astronomers, oceanographers, and climatologists.

How do researchers study the polar regions? They live in or visit the regions and observe and take measurements from towns, permanent research stations, temporary field stations, or ships. Researchers can also collect data from satellites and from automated ground instruments that monitor conditions in remote locations.

**Traditional Arctic knowledge**

Traditional Arctic knowledge is the way of life and the way of thinking that have been passed down through many generations. It is part of the history and culture of the Inuit, the First Nations, and other indigenous peoples of the Arctic. This knowledge has been used for thousands of years to help people survive in the Arctic. It is important to understand traditional knowledge because it can help us better understand the environment and how it is changing. Researchers are learning to work together to combine scientific research with traditional knowledge of the Arctic. By doing this, we can better understand the impact of climate change on the Arctic and find ways to deal with environmental change.

**An Antarctic discovery: the ozone hole**

The ozone hole, a dramatic dip in stratospheric ozone levels over Antarctica, was first discovered in 1985. In 1987 many countries signed the Montreal Protocol, an agreement to reduce the use of ozone-depleting substances that contribute to destroying the ozone layer. As a result, the ozone hole is expected to decrease in size over the next few decades.

**POLAR RESEARCH**

International Polar Year (IPY) 2007-2008 is a major international research program that aims to improve our understanding of the Earth's polar regions and their influence on the rest of the planet. The program will involve scientists from many countries working together to study the Arctic and Antarctic.

30

**What you hear is what you get?**

**[mju:zɪk]**  
**Music**

**[spi:tʃ]**  
**Speech**

Investigating Absolute and Relative Pitch in L2 Phonology

Moving on from previous studies linking language learning ability to musical ability, my research takes a more specific look at the musically trained ear and its potential role in second language pronunciation.

This is fundamentally based on the hypothesis that more accurate auditory perception skills are a key to more precise production abilities, thus leading to more native sounding pronunciation and intonation in the second language.

Stefanie Anja Wichmann  
PhD student in Music Technology at the Department of Electronics, Interdepartmentally linked to the Department of Language and Linguistic Science and the Department of Music.

THE UNIVERSITY of York

31

## Who'd live in a house like this?

" WANTED. Families, particularly women and children to work in the Textile Mill. They may be provided with comfortable houses..."

(from an advert placed by mill owner Thomas Evans in 1782)

Home of the first water-powered cotton mill, the Derwent Valley in Derbyshire presents a fascinating insight into the world of textile workers living within purpose-built communities.

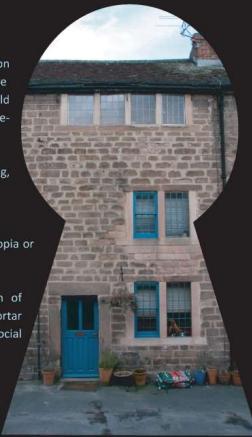
Employees were provided with housing, schooling and a weekly refuse collection .... but at what cost?

Did these workers live in an industrial utopia or in Blake's "dark satanic mills"?

Through the archaeological examination of building design; we can turn bricks and mortar into an understanding of the economic, social and cultural lives of these communities.

Join me as we go through the keyhole to examine the homes of the working-class.

Suzanne Lilley  
Department of Archaeology



THE UNIVERSITY *of York*

