

TITLE OF YOUR PAPER GOES HERE  
IT SHOULD BE CENTERED WITH  
A FONT THAT IS OF POINT SIZE 16

BY

FIRST NAME	LAST NAME
FIRST NAME	LAST NAME
FIRST NAME	LAST NAME

RESEARCH PAPER  
BASED ON  
NANOTECHNOLOGY LECTURES  
AT PHYSICS 2009

## ABSTRACT

This is a short section at the very start of your paper and it should tell the reader what the paper is about, i.e. the background to your work, your central idea and finally your conclusion. Note that the abstract is indented more than the rest of your work, it should be of a smaller point size, and point 10 is the best. Finally the abstract should avoid being more than about 10 lines long.

## INTRODUCTION

In this section you will describe the background to your paper, specifically the developments in nanotechnology research and how they relate to physics or other areas such as medicine. You need not go into a detailed explanation, but it is usual that you will offer references for the reader to follow up himself or herself. Typically, when referring to work or research by someone else you would identify the author and date of publication, for example.... 'As demonstrated by the work of Drexler (1986), Engines of creation ....' etc. In all cases where you have used other sources either paper or Internet based, they should be fully detailed in the reference section as shown below. In all cases you would include the name of the first author and date of publication when using these sources in your paper.

Your introduction will seek to demonstrate your understanding of the concepts and principles of nanotechnology research, in particular the importance and relevance to different areas, e.g. medicine; because of the possible uses in tissue repair and regeneration.

You will also show an awareness of current research relevant to the wider uses of nanotechnology research, such as its use in household objects.

Your understanding of the theoretical science of nanotechnology research does not need to go beyond that provided in the original lecture.

A good introduction will provide the reader with an understanding of the background to your work and the nature of the problem to be solved. It is not possible to say how long the introduction should be, suffice to say that the whole paper (including the reference pages) must not be more than 4000 words

Where you introduce diagrams or pictures they should be labelled using the convention figure 1, figure 2 etc. You need not put a description with your diagram label, but it should be clear from the text when you first mention a figure, exactly what that figure is showing the reader.

At this point we deviate from the common structure of scientific works and introduce a format that is unique to this particular paper.

## DISCUSSION

Here you will offer discussion of possible future developments of nanotechnology research, and/or a discussion of the ethical issues surrounding such future developments

Explanations of future applications offered need to show that you have understood the current research and can point to possible developments. For example, you can suggest that tissue repair systems working at a cellular level may be possible without detailing the exact mechanism of operation, merely the principle reached through reasoning. What is not acceptable is 'magic' or 'Star Trek' science i.e. explanations that make an appeal to scientific methods and principles that have no foundation in current technology.

This section should comprise the bulk of your paper and is in a real sense 'the point' to your work. Here we should find a detailed exposition of your ideas. In the introduction you have laid out the background and the science that is current. In this section we should read your thoughts on what developments could be achieved. It must be stressed this is a theoretical paper, it is not expected that you conduct the work necessary to achieve your aims.

As narrative this section offers the reader pointers to future developments first mooted in your introduction. Please understand you will get no credit for simply repeating the notes/slides that you were given or restating current research. This section requires that you offer a chain of reasoning that offers an explanation of how the science of nanotechnology research could change and influence medicine or other scientific or technological areas in the coming decades.

## CONCLUSION

This part of your paper provides the reader with a summary of your thoughts and ideas. It should also highlight any problems with your ideas and an indication of how any future developments might overcome them. Once again it cannot be stated as a working rule how long this section should be. But as a rough guide if your paper is the maximum allowed length of 4000 words (including references and the cover sheet), then the introduction and conclusion should take up around 1000, with the 3000 words taken up by your explanation of future developments and/or the ethical issues surrounding those developments. Clearly the 4000 words including references etc. are a maximum; you can submit fewer words.

Finally you will notice that the pages are justified on both sides, that is to say the start and end of each line is perfectly aligned with all other lines on the page. We suggest that the bulk of your paper has a point size of 12. This should present no problem to

your word processing programme. Whilst Microsoft Word is the word processor of choice, you can use any that you wish provided it is possible for me to open the document using Microsoft Word.

### SAVING YOUR FILE

So that we are able to readily identify your paper we ask that you use the following conventions when using a file name to save your file:

One author e.g. Jane Smith, save file as: SmithJ.doc (doc is the extension of a Word document)

Two authors e.g. Bill Jones & Tim Smith, save file as: Jones&Smith.doc

More than two authors e.g. Tim Adams, Mary Smith, Jim Jones, save file as: AdamsTetal.doc, where the etal stands for 'and others'. Of course make sure all contributing authors names are on the front cover sheet.

### REFERENCES

These should be laid out on a separate page and like the coversheet should not be counted in the five pages allowed for your work. You should only cite work that you have used. Paper references should have full details including page numbers (as shown below), whilst web references should include a direct link to the paper. The references should be in alphabetical order using the second name of the first author as the key. Please note it is unnecessary to include the background notes provided in your lecture as a reference source, only those works that you search out or use yourself.

#### Example Fictional References:

This is how you layout the reference for a book

Jones, J. B. (2001) Nanotechnology in Medicine, London, Hodder & Stoughton

This is how you layout the reference for a journal

Limberk, F. T., Smith M. P. (2002) The Development of Nanosurgery. In the Journal of Nanotechnology, 91, 35-47.

This is how you layout the reference for a web source

Nanotechnology, a Hard Pill to Swallow [www.i-sis.org.uk/nanotechnology.php](http://www.i-sis.org.uk/nanotechnology.php)

Clearly it would be a real advantage to most readers to have 100% web citations, but in reality they will be obliged to work from whatever references you have found, wherever you have obtained them.

## MARKING CRITERIA

### Will my report Pass or Fail?

This is the most fundamental criteria of all, dividing those who attained a suitable standard from those that did not. Below are the main reasons for a paper to fail to make the grade:

- A failure to show an understanding of the principles of Nanotechnology research.
- A paper consisting of my own notes quoted back to me.
- Poor scientific reasoning or an appeal to 'yet to be discovered science'.
- Plagiarism. The Internet may make it simple to obtain chunks of other authors work, but it also makes it easy to detect.
- A major failure to follow the style and presentation guidelines that are clearly laid down. In these instances, (and those with poor spelling etc. will be included), the authors were invited to resubmit.

### PASS

This work will show a clear appreciation of the current development of Nanotechnology research.

The author(s) demonstrate that they are able to apply their understanding to solve a 'real-world' problem: 'Future Developments in Nanotechnology. Their clear thinking and application of scientific principles will merit publication of their work and they will have my congratulations.

### PASS WITH MERIT

Those in this category will display all that is found above, but in addition it will be clear that they have put in extra work researching the problem, and whose level of research for the problem to be solved showed a deeper than average awareness of the scientific literature they presented in support of their paper. Note that it is not enough to perform the extra research it must be demonstrated and those in this category will do so.

### PASS WITH DISTINCTION

These individuals displayed the features of the other two categories but in addition they approached the problem in a fashion that was original and it is this originality that I would like to recognise.

## REPORT TEMPLATE

You need the following sections:

Page 1: COVER SHEET

Page 2: ABSTRACT and INTRODUCTION

Pages 3, 4 and 5: DISCUSSION

Page 6: CONCLUSIONS

Page 7: REFERENCES

Attach completed report to a covering email and send to: [physics@btconnect.com](mailto:physics@btconnect.com)

Report must be a Word document or saved as Rich Text Format, RTF.

Group size must be a maximum of 3.

Word limit is a total of 4000 words, including all tables, references and appendices.

Closing date for submitting completed reports is Sunday March 14th 2010.

Good Luck!