Highlighting your work
Some simple suggestions & hints!

Capetown school – July 7-17th, 2018

Goals of this presentation

- Communicate your work is very important
  - Paper writing
  - Presentation
- Some simple 'personal' suggestions & guidelines extracted from my own experiences illustrated with some typical exemples (Some extracted on web site)

Writing a paper

Structure of a Paper

Scientific writing follows a rigid structure –
a format developed over hundreds of years

Consequently, a paper can be read at several levels:

- Some people just will refer to the title
- Others may read only the title, abstract,, summary and conclusions.
- Others will read the paper for a deeper understanding

Authors Listing

- ONLY include those who have made an intellectual contribution to the research
- OR those who will publicly defend the data and conclusions, and who have approved the final version
- Order of the names of the authors can vary from discipline to discipline
  - In some fields, the corresponding author's name appears first

Title

- Describes the paper's content clearly and precisely including keywords
- Is the advertisement for the article
- Do not use abbreviations and jargon
- Search engines/indexing databases depend on the accuracy of the title - since they use the keywords to identify relevant articles

Abstract

- **Briefly** summarize (often 150 words) - the problem, the method, the results, and the conclusions so that
  - The reader can decide whether or not to read the whole article
- Together, the title and the abstract should stand on their own
- Many authors write the abstract last so that it accurately reflects the content of the paper

See: The Structured Abstract: An Essential Tool for Research
http://research.mlanet.org/structured_abstract.html

Methods

- Provide the reader enough details so they can understand and replicate your research
- Explain how you studied the problem, identify the procedures you followed, and order these chronologically where possible
- Explain new methodology in detail; otherwise name the method and cite the previously published work
- Include the frequency of observations, what types of data were recorded, etc.
- Be precise in describing measurements and include errors of measurement or research design limits

Introduction

- Clearly state the:
  - Problem being investigated
  - Background that explains the problem
  - Reasons for conducting the research
- Summarize relevant research to provide context
- State how your work differs from published work
- Identify the questions you are answering
- Explain what other findings, if any, you are challenging or extending
- Briefly describe the experiment, hypothesis(es), research question(s); general experimental design or method

Results

- Objectively present your findings, and explain what was found
- Show that your new results are contributing to the body of scientific knowledge
- Follow a logical sequence based on the tables and figures presenting the findings to answer the question or hypothesis
- Figures should have a brief description (a legend), providing the reader sufficient information to know how the data were produced and exhaustive caption

Discussion/Conclusion

- Describe what your results mean in context of what was already known about the subject
- Indicate how the results relate to expectations and to the literature previously cited
- Explain how the research has moved the body of scientific knowledge forward
- Do not extend your conclusions beyond what is directly supported by your results - avoid undue speculation
- Outline the next steps for further study

Citations & References

- Whenever you draw upon previously published work, you **must** acknowledge the source
- Any information not from your experiment and not 'common knowledge' should be recognized by a citation
- How references are presented varies considerably - refer to notes for authors for the specific journal
- Avoid references that are difficult to find
- Avoid listing related references that were not important to the study
- Anything taken from the web should be acknoxledge in particular pictures and presentation
- WARNING : Plagiarism tools are commonly used so any 'stolen' material can be easily traced

Components of a Paper

Section	Purpose
Title	Clearly describes contents
Authors	Ensures recognition for the writer(s)
Abstract	Describes what was done
Key Words (some journals)	Ensures the article is correctly identified in abstracting and indexing services
Introduction	Explains the problem
Methods	Explains how the data were collected
Results	Describes what was discovered
Discussion	Discusses the implications of the findings
Acknowledgements	Ensures those who helped in the research are recognised
References	Ensures previously published work is recognised
Appendices (some journals)	Provides supplemental data for the expert reader

Presentation

Goal of this presentation

- Today, it is very easy to prepare a presention with PPT BUT its depends of:
  - The context (school, conference, workshop …)
  - The audience (students, engineers, scientists, mixed
  - The level of the majority of the audience .
  - Depends of what message you want to give (results, overview, lessons)
  - Be carefull with animation
  - Style of presentation and content → example later
- Looks at the time you have
  - Number of slides
    - 1 per min in average
  - Quantity of information in a slide
    - Depends on type of information to explain
    - Isolate clearly what is important
    - Graphics, tables, text, images
- …

Fast Timing and TOF in PET Medical Imaging

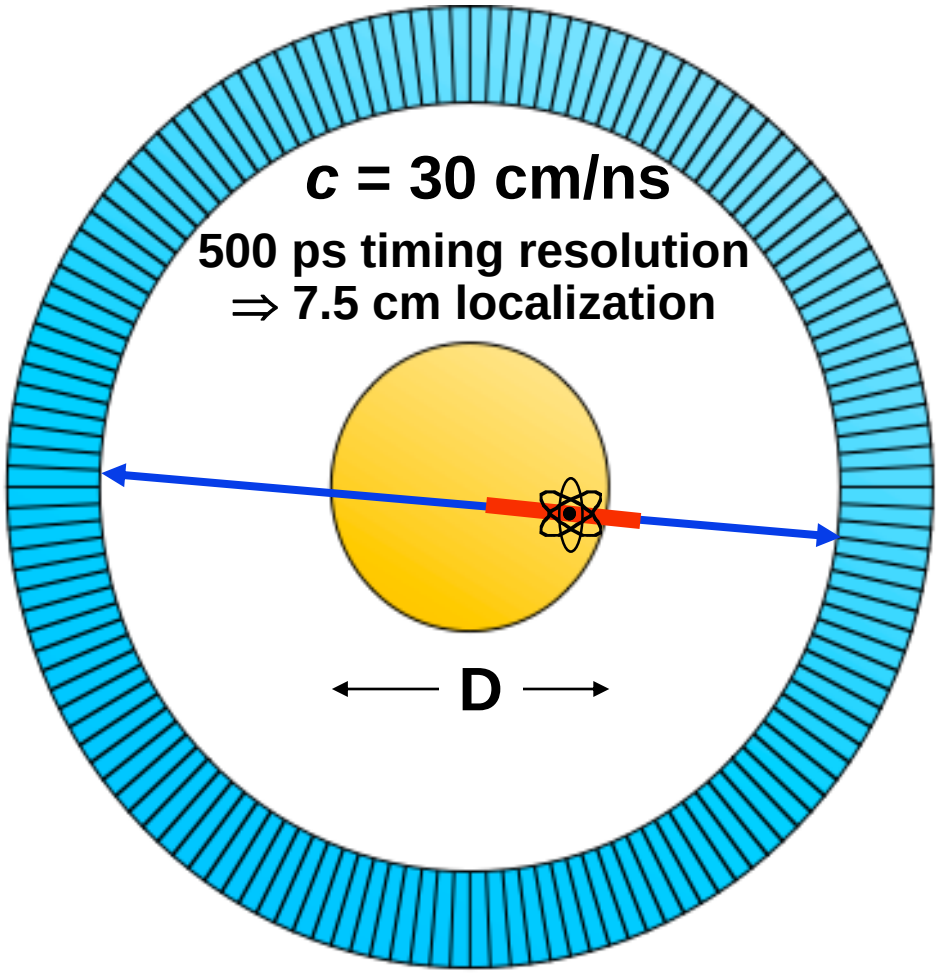
William W. Moses
Lawrence Berkeley National Laboratory
October 15, 2008

Outline:

- **Time-of-Flight PET**
- **History**
- **Present Status**
- **Future**

- **This work was supported in part by the U.S. DOE (contract No. DE-AC02-05CH11231) and in part by the NIH (NIBIB grant No. R01-EB006085).**
- **Thanks to M. Ullisch and W.-S. Choong of LBNL, M. Casey, J. Young, and B. Bendriem of Siemens Medical Solutions, and Y. Hämisch of Philips.**

Time-of-Flight in PET

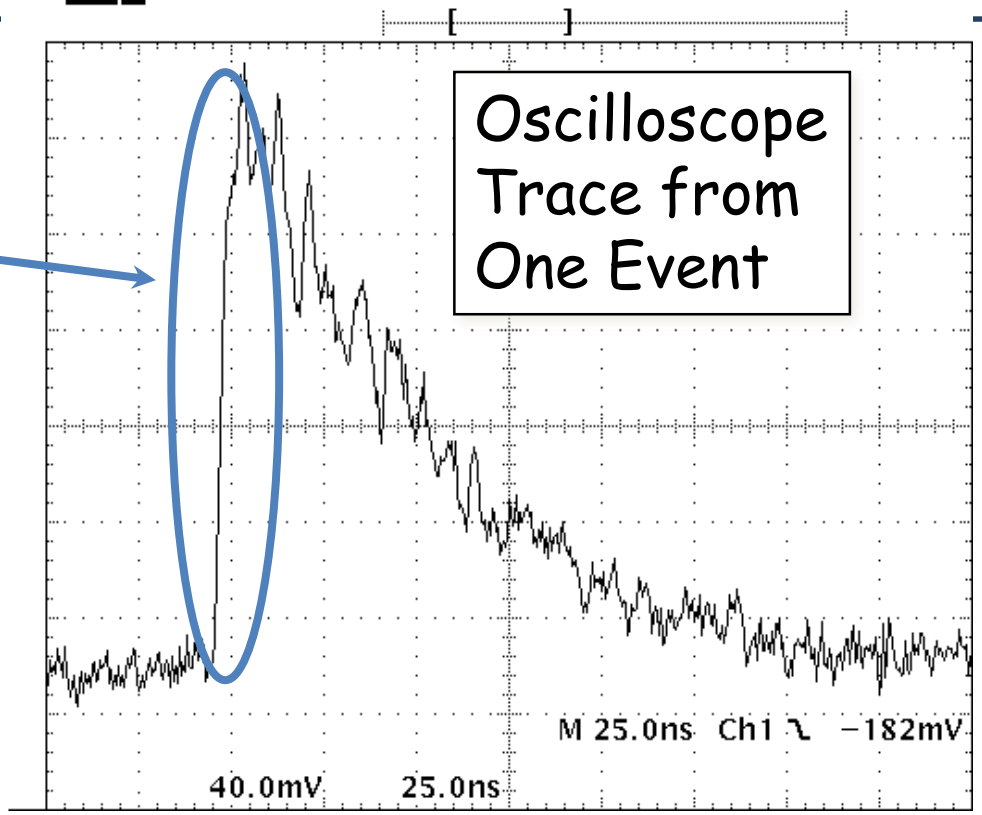


- Can localize source along line of flight.
- Time of flight information reduces noise in images.
- Variance reduction given by $2D/c\Delta t$.
- 500 ps timing resolution
  ⇒ 5x reduction in variance!

- Time of Flight Provides a *Huge* Performance Increase!
- Largest Improvement in Large Patients

Raw Signal From Photomultiplier Tube

Important Region for Timing



- Small Signal Level — 0.000000511 TeV
- Small Fraction of Scintillation Light in Leading Edge
- Fundamental Limit Due to Statistical Fluctuations

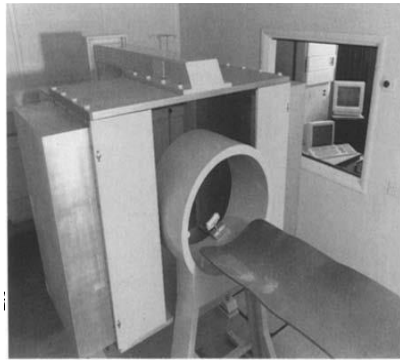
Adventures in the Nuclear Medical Imaging Wonderland

Simon R. Cherry

Departments of Biomedical Engineering and Radiology

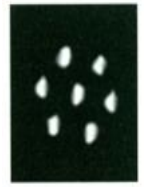
UCDAVIS
UNIVERSITY OF CALIFORNIA

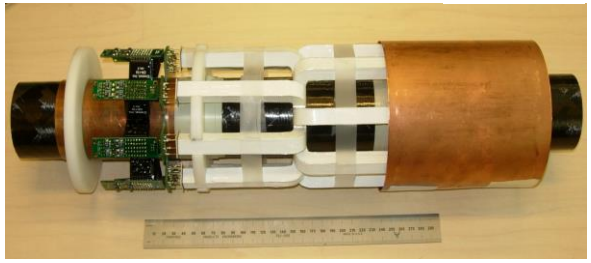
Positron Emission Tomography



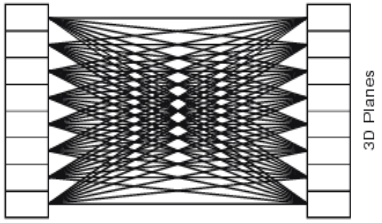
MWPC PET

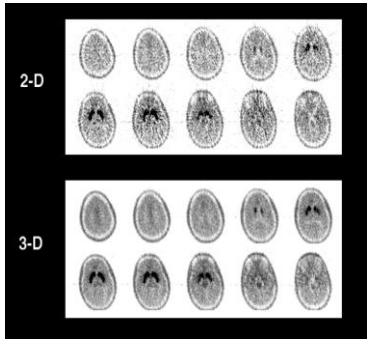
Small-animal PET



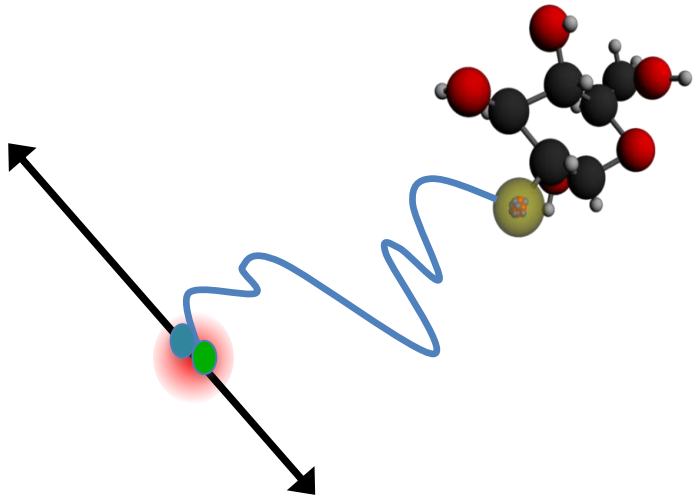


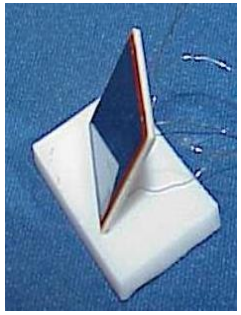
PET/MRI





3-D PET



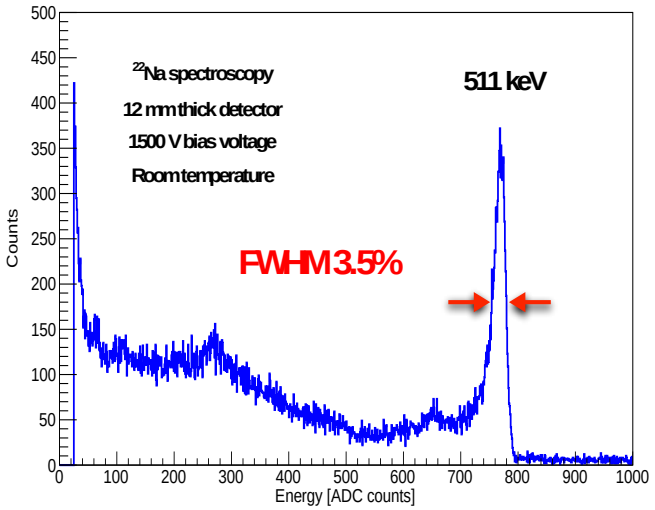


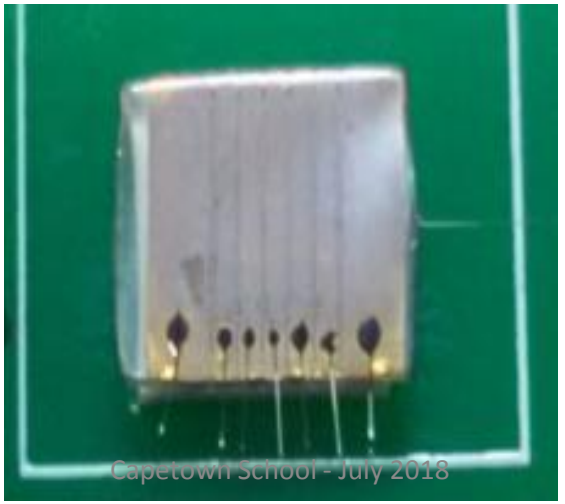
Depth-Encoding Detectors

Thallium Bromide

- **Improve detector efficiency**

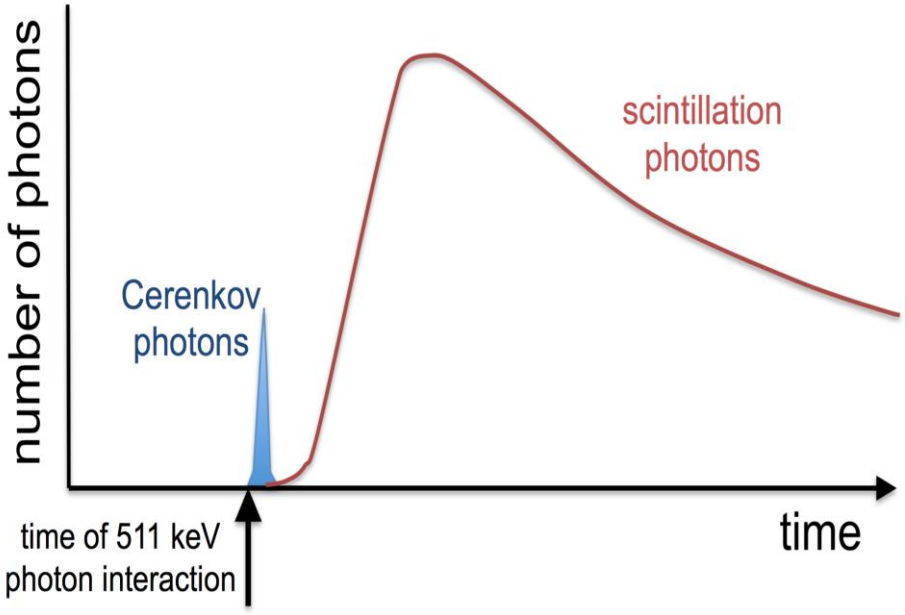
Cross-Section (cm^{-1})	Total	Photoelectric	Compton
L(Y)SO	0.82	0.28	0.54
BGO	0.89	0.40	0.49
TlBr	**0.95**	**0.42**	**0.53**

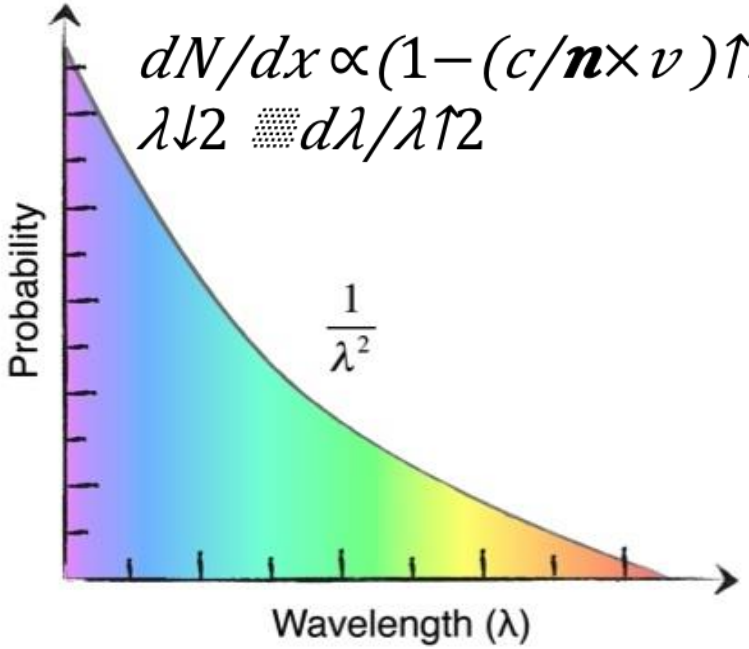




Friday 09:30
R15-5
Ariño-Estrada et al.

Using Cerenkov Radiation for Time-of-Flight PET





Korpar et al, *Nucl Instr Meth* A654; 532-8 (2011)
Brunner et al, *IEEE Trans Nucl Sci* 61; 443-7 (2014)
Lecoq et al, *IEEE Trans Nucl Sci* 61; 229-34 (2014)
Somlai-Schweiger et al, *Med Phys* 42; 1825-35 (2015)

Needs:

- Dense materials with high index of refraction and high transparency in blue/UV
- Photodetectors with high blue/UV sensitivity and low noise

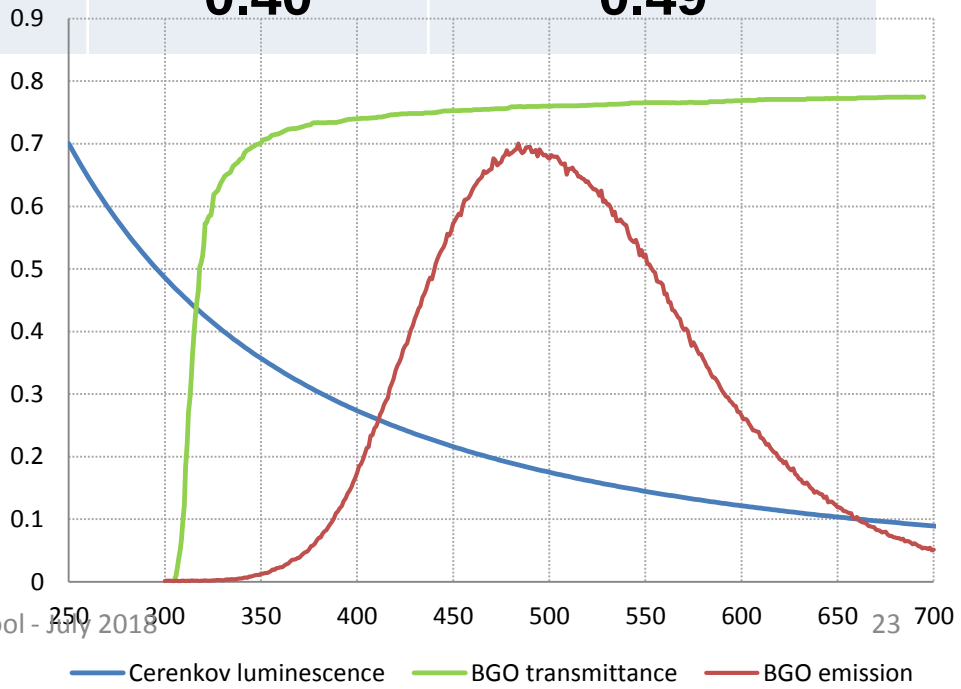
Bismuth Germanate

- **Improve detector efficiency**

Cross-Section (cm^{-1})	Total	Photoelectric	Compton
L(Y)SO	0.82	0.28	0.54
BGO	**0.89**	**0.40**	**0.49**

$$dN/dx \propto (1-(c/\boldsymbol{n}\times v)^2)\int_{\lambda_1}^{\lambda_2} d\lambda/\lambda^2$$

***n*=2.15**



Your presentation tomorrow

- One presentation per group
- You choose one exercice
- Lengh is 10 min → 5 slides max
- Structure:
  - Title-motivation results and conclusion
- Assume the audience knows nothing about it
- Produce a pdf file and have it ready in usb stick

School feddback questionnaire

Please fill it clearly and give to us at the end of the next session

It is ANONYMOUS !

Capetown Schoo

CAPETOWN SCHOOL JULY 2018 - Feedback questionnaire

Please fill this anonymous questionnaire – It is important for the organizers to understand what you learnt and if this school met your expectation and what can be improved for the future schools. Please print clearly

Did the school meet your expectations less than expected, as expected, more than expected

What did you like most?

Length of school too long just right too short
Comments:

What did you did not like?

Schedule? Like Do not like (why)

What do you think about the ratio of Exercises / Lectures : Smaller just right Larger

Do you think that interleaving lectures and exercises is better? YES NO
For example, with lectures in the morning and exercises in the afternoon?

To do all exercises or only selected exercises, but with longer time. Which is preferred?
ALL SELECTED

Should there be fewer exercises that go longer and "deeper"? For example, after the speed of light measurement, should we then budget more time to, for example, run the DAQ and analyze the data? Few exercises with longer time stay s it is

What can be improved?

Did you find the lectures interesting? YES NO

Level of lectures → too high just right too low

Do you have any suggestion for additional lectures? If yes which one(s)?

Did you find the WIE event interesting? YES NO

Exercises → Did you learn anything YES NO

Exercises: Were the objectives clear? YES NO

Exercises: Level of difficulty? Too high, as expected, too low
Suggestion for additional exercises

Additional comments on the back page --→