Education and Culture DG
Lifelong Learning Programme

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΙΔΡΥΜΑ ΚΡΑΤΙΚΩΝ ΥΠΟΤΡΟΦΙΩΝ
ΙΚΥ

IP Dos and Don'ts and other pitfalls

Hard-earned experience from 2¾ years of coordinating the Erasmus IP CPOTS
(Charged Particle Optics: Theory and Simulation)

Theo J.M. Zouros
Dept. of Physics, University of Crete – Heraklion
CPOTS coordinator

Ημερίδα Διαχείρισης
για τους Συντονιστές και το Διοικητικό Προσωπικό
Εντατικών Προγραμμάτων ERASMUS 2013,
Ξενοδοχείο Αμαλία, Αθήνα 31/5/2013

CPOTS: The innovative aspects – the course

- **CPO** is considered an advanced topic and not taught in most university curricula
- CPO is taught in **special Particle Accelerator Physics** courses/workshops at CERN, Brookhaven, etc. i.e. at big specialized particle accelerator research centers
- The emphasis of CPOTS is not on accelerator physics but on the **physics of much smaller devices** used in most atomic physics labs such as **lenses, electron spectrometers, time-of-flight analyzers and imaging devices**
- CPO is a rather "boring" subject with a lot of tedious mathematics having to do with the transport and focusing of particles and trajectory aberrations

CPO = Charged Particle Optics

CPOTS: The innovative aspects – the software

- CPO software such as SIMION can be used to **remove this tediousness** by allowing one to **see the particle trajectories** inside the instruments and how changing parameters (voltages, magnetic fields, distances etc.) can affect instrument characteristics (resolution, transmission, etc.)
- Simulations provide **invaluable insight** and **practical information** on best experimental parameters to use and improved instrumental design
- Can better prepare the student for the real experiment where time can be limited!
- A course on CPO + simulation software can thus be brought even to the **undergraduate level** offering a **unique and attractive educational package** for the student who wants to understand the basics as well as for the researcher who wants to better understand and improve the performance of their equipment

SIMION® 8.1
The field and particle trajectory simulator.
www.simion.com

Central theme: **Simulation enhances understanding**!

Sounds easy right?

The CPOTS IP – concept summary

An innovative intensive Charged Particle Optics (CPO) course (2 weeks, 6 ECTS credits):

Traditional theoretical CPO concepts are presented and explored utilizing CPO simulation software (SIMION).

That was much harder than I thought!

A physics course but with software to add intuition!
Challenge: How to effectively implement the software!

Emphasis on CPO laboratory instrumentation such as electrostatic lenses, electron spectrometers, and time-of-flight and imaging devices. Course explores their operation principles, performance characteristics and limitations.

For Advanced undergraduate, Master and PhD program students

The CPOTS IP in a nutshell

Host and Organizer:

Univ. of Crete - Heraklion

Participating Institutions:

1. **Afyon Kocatepe University – Turkey**
2. **Universidad Complutense Madrid – Spain**
3. **Selçuk University Konya - Turkey**
4. **Technische Universität Wien – Austria**
5. **University of Ioannina – Greece**
6. **Queen's University Belfast – UK (2012)**
7. **University of Debrecen – Hungary (2012)**
8. **University of Athens – Greece (2013)**

Hotel: 3.5 km away from UoC - 200m from beach
Lectures: Dept. of Physics lecture halls - UoC
Time: 14-17 days at the end of August
Support: 11 teachers, 17-20 students
Locals: 2 teachers, 1-5 students
Schedule: 9:00 – 17:30 weekdays
Excursions: Saturdays - Samaria (11), Spinalonga (12)
Rest: Sundays – visit to archeological museums
Budget: ~42k€ (2013)

Two week+ program overview

CPOTS 2013 - Programme of lectures and activities (Aug 15 – 31)

AUGUST 2013 - calendar of events

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15 CPOTS 2013 Arrivals 18:00-20:00 Rgistration 20:30 – Barbecue Party	16 CPOTS 2013 9:00 - 17:30 SIMION 8.1 workshop 18:00-20:00 Beach activities	17 CPOTS 2013 9:00 - 17:30 SIMION 8.1 workshop	18 CPOTS 2013 Day off More Arrivals 18:00-20:00 Rgistration 20:30 – Barbecue Party
19 CPOTS 2013 9:00 - 17:30 Unit 1 18:00-20:00 Beach activities	20 CPOTS 2013 9:00 - 17:30 Unit 1 20:30 Teachers dinner	21 CPOTS 2013 9:00 - 17:30 Unit 2 20:30 Night on the town	22 CPOTS 2013 9:00 - 17:30 Unit 2	23 CPOTS 2013 9:00 - 17:30 Unit 3	24 CPOTS 2013 9:00-19:00 Excursion to	25 CPOTS 2013 16:30-20:00 Visit to Knossos Archaeological site and Museum
26 CPOTS 2013 9:00 - 17:30 Unit 3 17:30 – 19:00 Visit to IESL/FORTH Research Centre	27 CPOTS 2013 9:00 - 17:30 SIMION 8.1 Advanced workshop 20:30 Teachers dinner	28 CPOTS 2013 9:00 - 17:30 Unit 4 20:30 Night on the town	29 CPOTS 2013 9:00 - 17:30 Unit 4	30 CPOTS 2013 9:00 - 13:30 SIMION 8.1 Project presentations and Final Exam 14:30-17:30 CPOTS Evaluations Certification ceremony 20:30 Farewell Dinner	31 CPOTS 2013 Departures	1

Non-class days Class days Social/cultural activities Procedures

http://cpots2013.physics.uoc.gr/ last update 22 April, 2013 Page 1

Be aware of cultural differences – they can adversely affect your IP if not taken into account!

dos

- Do remember that **Muslims celebrate Ramadan** sometimes in the summer (they are not allowed to even drink water during the day – can be tough on the lecturer!)
- Do remember that **Muslims don't eat meat** (only meat prepared in the **Halal**/**Kosher way**!)
- Do be aware that some countries **don't have a tradition of learning English** (be tough on English communication skills even if it creates tension in the beginning – it will be appreciated later)
- Do try to **mix up the students from the very start**

don'ts

- Don't allow the participation of students or teachers with **insufficient English** capabilities (especially in communication and understanding)
- Don't allow students from the **same university** (or even country!) to room together

Partner/Teacher Selection

dos

- Do find partners that can also **help with the teaching** – only sending students is not enough – can be resented by other teachers who do all the work!
- Do find teachers with **good level of English and IP topic knowledge**
- Do try to **distribute the work uniformly** – if teachers don't have the knowledge then put them to do **administration**
- Do **bring in experts** – everybody likes to hear/learn something new – however, beware if the expert can't come the next year – could create havoc to your curriculum!

don'ts

- Don't get teachers who are **not interested enough** just to have some more students attend the IP
- Don't have teachers who **don't know enough** even if they say they are willing to learn

Student selection

dos

- Do use a **uniform selection criterion** for all students (e.g. use the undergraduate grade point average - gpa)
- Do have **everybody agree on this criterion before** the selection process
- Do make sure they all have **adequate English** capabilities (at least B2)
- Do make sure you have **a waiting list of >30%** of main list
- Do **prioritize your waiting list** according to selection criteria
- Do place a **cutoff on your waiting list**,
- Do try to keep **student quality as high as possible**!

don'ts

- Don't **mix graduate and undergraduate gpas** (graduate gpas are always inflated!)
- Don't **break waiting list order** just to fill original partner quotas
- Don't accept everybody that applies! (don't want to be in the embarrassing situation to fail a student)

Observation: "Better" universities usually also have "better" applicants - this can create tensions between non-uniform quality partners – can become a problem!

Excursions – Cultural Outings

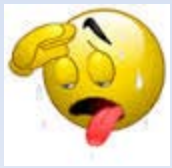
dos

- Do **combine physical** (e.g. hike) and **cultural** into one excursion – try to find a good balance
- Do add a **short boat trip** if possible (everybody seems to like boats!)
- Do **add a swim** to the excursion – just make sure everybody knows how to swim!

don'ts

- Don't make the physical excursion **too demanding** (e.g. Samaria gorge 18k hike turned out to be too demanding for most participants - Even though forewarned!)

I really thought I was in Better shape!



Student Work program

dos

- Do give out **projects** – 2-4 students with presentation at end – everybody liked the experience – mix the teams up internationally!
- Do assign the **projects early on**
- Do assign an **advisor to each project** group
- Do allow **at least 1 hour per day within the work program for project work**
- Do make students give **oral presentations** (15') on their projects at the end – could be part of their grade
- Do give **multiple choice exams** – easy to grade

don'ts

- Don't make the **projects too hard or time consuming** – students are already overloaded and too tired to work after the end of an 8 hour workday
- **Don't give out homework**
- Don't make the **exam too difficult** since not enough time to study

*Projects are a great idea to Improve **ACTIVE** student Participation but can be **tricky** to implement*

Organizational Stuff

dos

- Do **fill out evaluation forms in class**
- Do ask for **e-tickets and e-boarding cards**
- Do have teachers **collect all receipts**, travel documents etc. and send in **one registered mail** directly to you
- Do arrange to make **only one bank transfer** for countries **not on the euro** (e.g. UK, Turkey Hungary) – otherwise can lose up to 40euros/bank transfer just on bank fees!

don'ts

- Don't give evaluations to students to complete **after departure**
- Don't collect part of the tickets, receipts or boarding passes on arrival – its easier to **get them all at the very end** in one envelope!
- Don't wire money to each bank account for participants **not on the euro**.

Plan carefully – don't waste
Time or money!
The devil is in the details!

Tools and Assistance

dos

- Do have a **practical web site** – it can be used as your central organizing and information tool

  http://cpots2012.physics.uoc.gr/

- Do find someone close by to maintain it as it needs practically **daily updates**!
- **Do it yourself** – it's not too difficult once you have the original design
- Do get **minimal experienced secretarial support** for handling **paperwork and e-mails**

don'ts

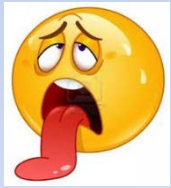
- Don't get a web site that you **cannot regularly update** – it can be more of a hindrance than a help
- Don't get some **professional company** to administer it for you – too costly, too slow

- Don't **do it all yourself** (as I did!)

Recommendations to Erasmus/IKY

dos

- Do add an **extra organizational budget proportional to # of participants** (useful for excursions, meals etc.)
- Do give **incentives to save money** (e.g. travel money saved from charter flights can go to general budget)
- Do allow for **less than 8 hour workdays** – 7 hours of lectures/day just too **exhausting**! (everybody's complaint in evaluation forms!)



- Do give some **financial incentive to the organizer**! Everybody else get's their travel, their stay and their students covered!

don'ts

- Don't just give a lump sum **independent of number of participants**
- Don't **require hourly attendance sheets** – just too ridiculous – we are not in high school any more – just morning and afternoon program could be enough!

- Do give **daily allowance to local students too** **(5€ for lunch/bus?!)**

Why the hell am I doing all this work?

Conclusions

- The **Erasmus IP** is a **terrific experience** for students and teachers alike
- **IKY** does an **excellent job** administrating the IPs with a **minimum of unneeded bureaucracy**!

Why can't other programs be as easy and flexible?

- Would I do it again?

Not as organizer and certainly **not alone**, but **definitely as a teacher!**

Hope this was useful and will encourage questions and discussion

Thank you for your attention!

CPOTS: Photo gallery











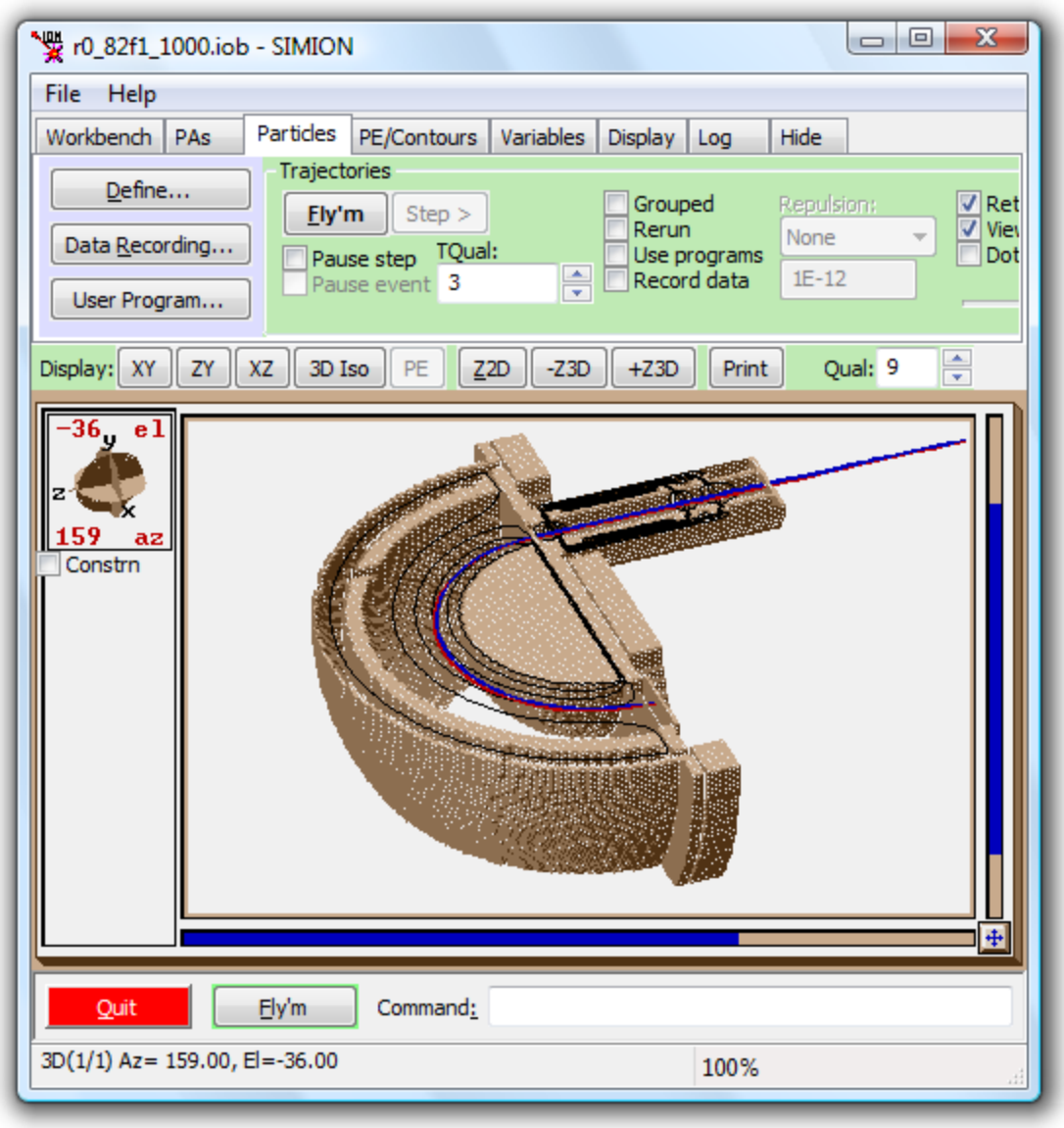







[Video: Diving off the boat in front of Spinalonga]

Example of electron trajectories in Hemispherical analyzer



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Attendance and Typical Social Program

Supported Stay at CPOTS hotel: 16 nights

Attendance:

- Number of supported teachers: 11
- Number of supported students: 20
- Number of local (UoC) teachers: 2
- Number of local (UoC) students: 5
- Guests: 3
- Total number of participants: 41

Social, Educational and Cultural Programme:

- Thursday Aug 15 - Barbecue Party (free)
- Friday Aug 16 - Beach activities (free)
- Saturday Aug 17 - Not yet decided
- Sunday Aug 18 - Barbecue Party/Reception (free)
- Monday Aug 19 - Beach activities (free),
- Tuesday Aug 20 - Teachers dinner
- Wednesday Aug 21 - Night on the town
- Saturday Aug 24 - All day excursion (free)
- Sunday Aug 25 - Visit to Knossos Archaeological site
- Monday Aug 26 - Guided tour the IESL/FORTH research centre (free)
- Tuesday Aug 27 - Teachers dinner
- Wednesday Aug 28 - Night on the town
- Friday Aug 30 - Farewell dinner (free)

Typical Work program – opening day

Day #	Time	Unit #	Lecture / Activity	Person responsible	place
4	09:00-09:15	W	Welcome to CPOTS 2013 – Programme presentation	Theo Zouros	Lecture room
		1	**Transport of Charged Particle Beams**		
	09:15-10:00	1.1	Charged particle motion in Electromagnetic Fields	Genoveva Martinez Lopez	Lecture room
	10:00-10:30				
	10:30-11:00	1.2	Numerical methods for the calculation of charged particle trajectories	Genoveva Martinez Lopez	Lecture room
	11:00-11:30		**Coffee Break**		Coffee room
	11:30-12:00	1.3	The Monte Carlo technique – Applications to SIMION	Christoph Lemell	Lecture room
	12:00-12:30				
	12:30-13:00	1.4	Numerical methods for solving Laplace equation	Genoveva Martinez Lopez	Lecture room
	13:00-13:30				
	13:30-14:30		**Lunch Break**		Student Mensa
	14:30-15:00	SP1	SIMION Project assignments/Groups	Theo Zouros	Lab
	15:00-15:30				
	15:30-16:00	SP2	Projects: Group meetings/organization/division of labor - discussions	Various teachers	Lab
	16:00-16:30				
	16:30-17:00	SP3			Lab
	17:00-17:30				
	18:00-20:00		*Beach activities*		Beach near IP Hotel

Typical Work program – closing day

Day #	Time	Unit #	Lecture / Activity	Person responsible	place
15			**SIMION Projects and Final Exam**		
	09:00-09:30	SP3	SIMION 8.1 Student Project Presentations	Genoveva Martinez Lopez	Lecture room
	09:30-10:00			Béla Sulik	
	10:00-10:30	SP4		Hamdi Sukur Kilic	
	10:30-11:00			Mevlut Dogan	
	11:00-11:30		**Coffee Break**		
	11:30-12:00	SE1	SIMION 8.1 Comprehensive Final Exam	SIMION teachers	Lab
	12:00-12:30				
	12:30-13:00	SE2	SIMION 8.1 Comprehensive Final Exam (continued)	SIMION teachers	Lab
	13:00-13:30				
	13:30-14:30	**Lunch Break**			
	14:30-15:00	A1	Logistics of Reimbursement – Receipts – Boarding passes	Mevlut Dogan	Lecture room
	15:00-15:30				
	15:30-16:00	A2	IP Evaluations – Filling out Official and private Evaluation Forms	Dogan/Greenwood	Lecture room
	16:00-16:30				
	16:30-17:00	A3	Certification Ceremony/Awards	Theo Zouros	Lecture room
	17:00-17:30				
	20:30-23:30		**Farewell dinner** **(free for all CPOTS 2013 participants)**	Theo Zouros	Restaurant to be announced

Budget

						Subsistence	Travel
	No. of students	Country of origin	Erasmus code	Country of destination	Duration in days (including travel days and weekend days without subject-related activities)	Total estimated funding for subsistence *	Total requested grant support for travel (90% of the estimated costs)
						A	B
	3	TURKEY	TR AFYON01	GREECE	17	20*3*17= 1.020	0.9*1.650 = 1.485
	2	SPAIN	E MADRID03	GREECE	17	20*2*17= 680	0.9*1000 = 900
	3	TURKEY	TR KONYA01	GREECE	17	20*3*17= 1.020	0.9*1.650 = 1.485
	3	AUSTRIA	A WIEN02	GREECE	17	20*3*17= 1.020	0.9*1.550 = 1.395
	3	GREECE	G IOANNIN01	GREECE	17	20*3*17= 1.020	0.9*1.200 = 1.080
	1	UK	UK BELFAST01	GREECE	17	20*1*17= 340	0.9*500 = 450
	2	HUNGARY	HU DEBRECE01	GREECE	17	20*2*17= 680	0.9*1100 = 990
	3	GREECE	G ATHINE 01	GREECE	17	20*3*17= 1.020	0.9*900 = 810
Total	20					6.800	8.595

						Subsistence	Travel
	No. of teachers	Country of origin	Erasmus code	Country of destination	Duration in days (including travel days and weekend days without subject-related activities)	Total estimated funding for subsistence *	Total requested grant support for travel (75% of estimated costs)
						A	B
	1	TURKEY	TR AFYON01	GREECE	15	1.434	0.75*550 = 412.50
	1	TURKEY	TR AFYON01	GREECE	17	1.434+161*2/7=1.480	0.75*550 = 412.50
	1	SPAIN	E MADRID03	GREECE	15	1.434	0.75*500 = 375.00
	1	SPAIN	E MADRID03	GREECE	17	1.434+161*2/7=1.480	0.75*550 = 412.50
	1	TURKEY	TR KONYA01	GREECE	15	1.434	0.75*550 = 412.50
	1	AUSTRIA	A WIEN02	GREECE	17	1.434+161*2/7=1.480	0.75*500 = 375.00
	1	GREECE	G IOANNIN01	GREECE	17	1.434+161*2/7=1.480	0.75*400 = 300.00
	2	UK	UK BELFAST01	GREECE	17	2(1.434+161*2/7)=2.960	2*0.75*500 = 750.00
	1	HUNGARY	HU DEBRECE01	GREECE	15	1.434	0.75*550 = 412.50
	1	GREECE	G ATHINE 01	GREECE	15	1.434	0.75*300 = 225.00
Total	11					16.050	4.125

Granted

a) Project organisation rate (fixed)	6.810€
b) Total estimated subsistence costs – Students and teachers (sum of amounts under columns A)	6.800+16.050 = 22.850€
c) Total estimated grant for travel costs – Students and Teachers (sum of amounts under columns B)	8.595+4.125 = 12.720€
Total requested funding (a + b + c)	**42.380€**