Project Management for Scientists 2011

Exercise 9

Due on 12 June 2011 at 11:00 by email to C.U.Keller@uu.nl with the subject line `PMSci2011: Exercise 9`

Problem 1

Evaluate all attached proposal (except for your own) according to the following guidelines:

Nirvana Science Foreclosures (NSF) requested proposals from MSc and PhD students and postdocs taking the Project Management for Scientists course at Utrecht University to initiate innovative research in all areas of science. Grants will be awarded to individuals for projects up to 5 years in duration and up to a total amount of €250'000.

For each proposal, please provide the following:

- A one-sentence summary of the innovative aspects of the proposed research
- A one-sentence verbal assessment of the proposal
- A numerical grade between 1 (bad) to 10 (excellent) on the following aspects:
    - Innovativeness of the proposed research
    - Likelihood to achieve the proposed research goals
    - Realism of the proposed research plan and budget
    - Qualification of the proposer to carry out the proposed research

Please submit your evaluation by 12 June 2011 at 11:00 to Christoph Keller, c.u.keller@uu.nl.

Cleaning of plasma facing mirrors in ITER

Gido van der Star
Bl. van Treslongstraat 85 bis
3554 BL Utrecht
The Netherlands
g.vanderstar@students.uu.nl

I am a master student in the Nano materials: Chemistry and Physics master at Utrecht University, which I started after obtaining bachelor degrees in Artificial Intelligence and Physics. My scientific activities have centered around observing a laser pulse after it has been influenced inside a material. I also teach fellow student climbers how to instruct new climbers to practice this sport safely.

Summary

We will adapt a cascaded arc plasma source to be able to operate with an array of plasma channels to have it produce a very wide plasma. The cleaning capacity of this plasma jet on molybdenum and tungsten mirrors will be investigated.

Project Description

The energy producing plasma in ITER will be studied extensively. For this scientists want to have a look inside the plasma containing torus, this is usually done via mirrors, which thus have to face the edge plasma. These mirrors will get contaminated with carbon and/or beryllium. By exposure to a high flux plasma these mirrors can be cleaned. This project aims to develop such a source and demonstrate its cleaning abilities.

Innovative Research Aspects

This project will produce a homogenous wide beam plasma source.

Task	Time estimate
Making plans for cascaded arc array	3 months
Assembly of a cascaded arc array	3 months
Making specifications for exposure chamber	1 month[1]
Ordering of exposure chamber	1 month[1]
Testing of the cascaded arc array	3 months
Improving of the cascaded arc array design and testing	1 year
Exposing of 'dirty' mirrors to cascaded arc array plasma	3 months
Total	2 years

Table 1: Project plan

Description	Cost (k€)
Wages	70
Facilities	20
Workshop time	70
Raw materials	50
Exposure chamber	30
Expenses	10
Total	250

Table 2: Budget

[1] concurrent with assembly of a cascaded arc array

The influence of footbal club on the behavior of their own fans

Abstract

Agression and violence of football fans towards rivalry fans, the referee or just inoocent bystanders is still a serious problem in society. The football clubs themselves play a key role in this problem, because they are held responsible for the behavior of their own fans. Hence, changing the attitude of the football clubs can reduce the number of football-fan-violence relating incidents by 20%.

Project Description

A new approach is going to be used in this project to reduce the football-fan-violence relating incidents. A selection of 10 different proffessional football clubs will be made. All of these football clubs will be monitored for a period of 1 year, by a specialist. These specialists will not influence the decicions made by the clubs regarding violence-relating issues during that period, but olny observe. After 1 year the specialist will take over the decision making for 1 year and the clubs are obligated to execute those decisions. The project manager overviews and manages the whole period of 2 years.

Innovative Research Aspects

The goal of this new approach is give the footbal clubs some time to make decisions of these issues on their own without external interference, hoping that the clubs take their responsibilitity. After this period the specialist will try to adjust the decisions of the football to reduce the football-fan-violance relating incidents. So far football did not recieve any professional help in this way and governments immediatly interfered, often drastically.

Project Plan

Tasks	Schedule
1. Observation of 10 football club by 2 specialists (each specialist observes 5 clubs)	12 months
1.1 Introduction with clubs	1 month
1.2 Write report to project manager	every 3 months
1.3 Annual report	after 12 months
2. Specialist takes over decisions making (agiain each specialist 5 clubs)	12 months
2.1 Write report to project manager	every 3 months
2.2 Final report	after 24 months

Budget

List	Costs
specialist	80000
specialist	80000
project manager	60000
other expenses	30000
total	250000

Contact:

Lenze van der Vegt, 28 years old, Bsc in Physics
Fregatstraat 45
3534 RA Utrecht
Netherlands

Project Management for Scientists 2011

By: Jennifer Heuijerjans 3096114
6 June 2011

Exercise 8

Problem 1

Title: Hepatitis B infection rate in the non-diagnosed population

Contact Person: Jennifer Heuijerjans
Willem van Noortstraat 94
3514 GH Utrecht
The Netherlands

Biography: Jennifer Heuijerjans has obtained a Summa cum Laude Bachelor of Science at the honours college 'University College Utrecht', the Netherlands. Currently, she fulfills a board position for the Utrechtsch Studenten Concert, the oldest symphonic orchestra of the Netherlands. In addition, she hopes to obtain a Minor in Entrepreneurship end of this year.

Project Description Previous research has hinted at the alarming idea that the prevalence of chronic viral infections in the Western World is much higher than current estimates suggested based on the number of diagnosed patients. Since Hepatitis B is one of the most important vectors responsible for chronic viral infection, this research will investigate the prevalence of Hepatitis B in the supposedly non-infected European population. The outcome will allow for an accurate evaluation of the current infection prevention policy and will increase our understanding of viral behavior.

Innovative Research Aspects Currently, much is unknown about the infection rate and infection prevalence of chronic infectious diseases such as Hepatitis B. Gaining understanding regarding this topic will contribute to public health.

Project Plan & Budget *Unfortunately, I was unable to find the exact numbers…*

Spectropolarimeter add-on for the iPhone

Stephanie Heikamp, Master student Astrophysics and Space research
Sterrekundig Instituut Utrecht (SIU)
Sterrekundig Instituut Utrecht, Princetonplein 5, 3584 CC Utrecht, the Netherlands

June 6, 2011

Brief biography

For my bachelor research project I did lab verifications of components and subsystems of the Small Synoptic Second Solar Spectrum Telescope (S^5T). This instrument measures the weak, turbulent magnetic field in the Solar atmosphere through the detection of linear polarization close to the limb of the Sun. I am still involved with this instrument as I went for a testing and observing run of the instrument to Kitt Peak, Arizona where the S^5T is installed.

Summary

This is an application for a master research project. This project uses the Spectropolarimeter for planetary exploration (SPEX) technology introduced by Snik et al. (2010) and will be transformed in an instrument which can be attached to the iPhone, and will introduce spectropolarimetry to the public. The duration of this project is from 30/8/2011 until 30/6/2012, see the table below for more information.

The SPEX-application will detect and characterize aerosols in the Earths atmosphere like dust particles due to urban and industrial expulsion, or due to natural phenomena such as volcanic eruption. To study aerosols in the Earths atmosphere one can use the scattered light reflected of the particles. The degree of linear polarization created by the aerosols can be thought of as an indicator for the size, shape and composition of the aerosols.

The ability to observe the sky in a completely different way by means of an iPhone camera add-on will contribute to the overall interest in science. It also will be an exciting learning tool for physics students at any level of education. The consumer can have direct contact with his or her environment by pointing the add-on towards the sky.

Project Phase	**Duration**	**Costs (EUR)**
Preliminary study	1 months	3.000
Design/Manufacture Prototype	3 months	10.000
Testing	1 months	2.500
Design/Manufacture add-on	4 months	100.000
Testing	1 months	3.500

References

Snik, F.; Rietjens, J.H.H; van Harten, G.; Stam, D.M.; Keller, C.U.; Smit, J.M.; Laan, E.C.; Verlaan, A.L.; ter Horst, R.; Navarro, R.; Wielinga, K; Moon, S.G.; Voors, R., *The Spectropolarimeter for Planetary EXploration* (2010)

Proposal Title	**Investigating the Solar Magnetic Cycle:** *Improving Space Weather predictions and promoting safer Space Travel.*
Proposer	**Nicola Fitzsimons,** *Masters Student***.**
Contact address	Utrecht University, Buys Ballot Laboratory, Department of Astrophysics.
Date	2nd June 2011

Document Purpose:

This project proposal is an outline written by the proposer in order to acquire funding from the Nirvana Science Foundation (NSF) to carry out, and complete, research on the proposed topic.

1. Biography of Principle Investigator:

Nicola Fitzsimons is to be the principle investigator on the project as aforementioned. She is currently a Masters Student at Utrecht University studying Astrophysics and Space Research. Previously, she has completed an undergraduate study in Trinity College University in Dublin from which she obtained a BA. Mod in Natural Sciences (astrophysics). She successfully carried out an undergraduate Research project entitled 'Investigating the Solar Magnetic Cycle and Flare Activity', the results of which were presented as part of a poster at the IAUS 273 in L.A last August, and have led to the idea to carry out a further investigation into the topic. This undergraduate research has been the primary reasoning in selecting this title and constructing this proposal.

2. Project Summary:

To improve space weather predictions, and therefore allow for safer space exploration, it is necessary to understand the solar magnetic cycle. This project, by analysis of multiple solar cycles, including tracking the complexity of active regions as they evolve over 11-year periods, will reveal the structure of the solar magnetic field below the photosphere, in particular it's origins. Knowing the magnetic structure will lead to an understanding of solar phenomena such as solar flares and thus Coronal Mass Ejections that are the main source of unpredictable space weather.

Innovative Research Aspects:

Details surrounding the state and condition of the solar magnetic field depend heavily upon theory. It is the innovative aim of this project to discover the true nature of the solar magnetic field below the photosphere. This project will look at the spatial, temporal, complexity of active regions within in each solar cycle and compare with available data from other solar cycles. The findings will be applied to solar dynamo models indicating the existence of the tachocline and variability of flux tubes in the convective zone during a solar cycle.

Project Plan:

- Apply SWOT analysis to identify key requirements; helping toward a more efficient project.
- Set up Work Breakdown Structure (include, tasks, dependencies, constraints, time estimates).
- Review scientific requirements of the project.
- Clarify roles and responsibilities.
- Asses any underlying risks
- Execute project with continuing communication between project team members.

Budget:

- IDL 8 license fee @ €8,000 (once-off)
- Server Costs @ €1,000 per annum (total: €4,000)
- Travel and Subsistence @ €10,000 per annum (total: €40,000)
- Project team: Supervisor allowance @ €10,000 per annum (total: €40,000)
  Two students @ €18,500 each per annum (total: €148,000)

Project total cost: €250,000

Exercise 7

Peter de Lange, 0421863 6 June 2011 Project Management for Scientists

High pressure tomography

Contact person

Peter de Lange

Utrecht University, Heidelberglaan 8, 3584 CJ Utrecht, The Netherlands

p.j.delange@uu.nl, + 31 30 253 1234

Principal Investigator

The principal investigator is Peter de Lange. He is student Nanomaterials at Utrecht University.

Summary

A new technology will be developed to observe nanoparticles in catalysts in 3D at high pressure.

Project description

A better understanding of the catalysts used in the chemical industry is crucial for increasing its energy efficiency and reducing chemical waste. The activity of the catalysts is caused by the metal nanoparticles inside. The 3D shape of these can currently observed only in vacuum, while they are industrially used at high pressures, at which they have a different shape. In this project, for the first time electron tomography will be combined with high pressure sample holders, to obtain a 3D view of the nanoparticles at industrial operating conditions.

In tomography measurements, the sample is tilted. Scanning transmission electron microscopy images are obtained at the various angles, from which the 3D shape of the nanoparticles is reconstructed. A sample holder with thin SiN windows (20 nm) that are transparent to the electron beam is required for high pressure measurements. This sample holder will be designed in such a way that the sample can be tilted during the measurements.

The new technology will be applied to iron and cobalt catalysts for fluid catalytic cracking. This is the most important conversion process for biomass fuels. The shape of the nanoparticle in this catalysts depends on pressure. The 3D shape at high pressure is required for the development of better catalysts for the conversion of biomass to fuels.

Innovative research aspects

For the first time, 3D scanning transmission electron tomography will be combined with high pressure electron microscopy using a new type sample holder.

Budget	*k€*
PhD student, 4 yr	150
Sample holder construction	20
EM microscope time	10
Software module	10
Lab and chemicals	30
Contingency	22
Total	242

Project plan

Year 1	Design and construction of sample holder
Year 2	Sample preparation and
Year 3	Measurements and analysis
Year 4	Further measurements, closing

Title: Managing technological discontinuities

Contact person: Frank Schellen BSc

Contact address: Goedestraat 103W
3572RP Utrecht
The Netherlands

Biography

In 2007 I started at Utrecht University with the bachelor program science and innovation management (specialized in life sciences). In 2010 I finished the bachelor program with a thesis about the adoption of nano-drugs. After this bachelor program I followed the subsequent master program of science and innovation management. During the master I worked at the research institute NIVEL were I got experienced with practical research.

Summary

Established companies often fail to recognize and react to technological discontinuities. By enabling technology intelligence processes (processes that identify technological opportunities and threats that affect the survivability of a company) firms can react to these discontinuities on time, which is important for coping with technological discontinuities. Existing technology intelligence processes however focus on incremental technological change not on technological discontinuities.
The aim of this project is to analyze these technology intelligence processes in the context of radical technological .

Project description

The objective of this project is to identify different types of technology intelligence processes in the context of technological discontinuities and to analyze the effectiveness of the different types of technology intelligence processes for decision making. All the steps in the technology intelligence process will be analyzed. A case study approach will be used because this will provide a complete view of the whole system of technology intelligence processes. Interviews with important stakeholders will be conducted to develop an in-depth understanding of the technology intelligence processes.

Innovative research aspects

This project is innovative because it is the first study that uses the theory of radical innovations and technological discontinuities to provide insights and implications on how firms can cope with new radical technologies.

Project plan and budget

The project consists of three major phases: the first phase is a literature study of radical innovation theories and technology intelligence process. The second phase is to select companies and interview specialists from the technology intelligence and technology acquisition units and the top management. In the third phase the final output of the project will be completed: the article for publication. In total the project will cost €35.000 over a period of 1,5 years. The university of Utrecht already agreed to finance €10.000 so an additional grant of €25.000 is required.

Continuous Blood Glucose Measuring on Dogs

Contact person: Laurens Böhm

Address: Oirschotseweg 113,
5684NH Best,
The Netherlands

Biography: I started my Bachelor program Natuurwetenschappen en Innovatie Management at the University of Utrecht in 2007. After finishing this Bachelor in 2010 I started following the master Science and Innovation Management which developed to supersede the bachelor Natuurwetenschap en Innovatie Management. Currently I am in my first year of this Master. Next to this master I also have a job as assistant manager at the veterinary clinic Dierenkliniek den Heuvel in Best, The Netherlands.

Summary: For many dogs that have diabetes the traditional therapy of diabetes mellitus consists of daily administration of medicines combined with drawing blood from their paws or ears to measure their blood glucose levels. This daily and painful routine of blood glucose measuring can represent a heavy burden on the dogs and the relation of the owners with the dogs. This project will develop a continuous blood glucose device for diabetes dogs that is based on a human blood glucose device. Using this technology for dogs will improve the welfare of the dog and give accurate reading of the blood glucose levels. These accurate readings will inform the owner so that they can react quickly by administrating medication, increasing the life expectancy of the dog. This project will take two years and will costs 150.000 Euro's

Project Description: To improve the dog's life expectation and relief them of the daily burden of drawing blood from their paws or ears, this project´s goal is to further develop the technology of an existing human continuous blood glucose meter and adapt hat technology to be used with diabetes dogs. This newly developed device will not be a burden on the dogs welfare and will inform the dog's owner when the blood glucose values of the dog fall outside the normal range giving them the opportunity to react.

Innovative research aspects: This research investigates whether the existing human blood glucose technologies can be modified to continuously measure blood glucose levels in dogs. The device that continuously measures the blood glucose values of the dog will alarm the dog's owner when the blood glucose values of the dog fall outside the normal range. Furthermore the device should be easy to use by the owner and not be a daily burden to the dog.

Project plan and budget: The project starts by investigating the current technological state concerning blood glucose measuring devices. After this has been done a selection out of the previous technologies is made that can analyze the blood glucose levels in dogs. These technologies are then adapted to be able to accurately analyze the blood glucose levels in dogs. Once these technologies are successfully adapted they are combined with a user friendly device for the dog as well as owner, informing the owner that the blood glucose levels of the dog fall outside the normal range. The adaptation of the technology will be done in partnership with a biomedical engineer. Considering the project plan, the total project time will be two years. The costs of this project consists of two salaries ,investigating existing devices and building a new device, resulting in a total costs of 150.000 Euro's over two years.

Research for receiving MSc degree

Irene Polderman
Leuvenplein 187
3584 LK Utrecht
I.M.Polderman@students.uu.nl
+31629441979

Biography principle investigator
Since 2006 an Astrophysics student at Utrecht University. In the past few years I've gotten interested in Plasma Physics, with astrophysics as a first love I've tried to combine these to disciplines. Thus doing research about plasmas in the universe is combining the best of both fields. With the internships I did in Brussels at the IceCube Project and at the Public Information department of FOM Rijnhuizen, I learned a lot of the skills necessary for the research I propose.

Summary
A master research project at FOM-institute for Plasma Physics Rijnhuizen. This research will investigate the properties of dust, as is present in the universe, and its reaction when encountering a plasma. Another part of the research will consider the possible effect of such dusty plasmas on deep space research methods and astrophysical phenomena.

Project description
First we need to establish what kinds of properties belong to these dusty plasmas. In order to do this we can use simulations and special equipment. Next we need to establish the different kinds of observations we make in the universe that are affected by these dusty plasmas

Innovative research aspects
A lot of research has already been done on dusty plasmas, but the link between observations and this research is a new one.

Project plan
The time allocated for this kind of research is roughly an academic year – basically the second year of your graduate period. I plan to do this research in the period from Febuary to December of 2012. Notice that it is slightly longer than a normal academic year, but I intend to work 0.9 Full-Time Equivalent (FTE), alternatively, this means 4.5 days in a 5 day working week.

Budget
€ 5600 salary for the graduate student
€ X maintenance for equipment
€ X salary for the technicians operating the device
€ X running the equipment (electricity etc)

Magnetars

Unexplored stars with an extremely powerful magnetic field

Kimberly Jongman, Utrecht University

Summary

Magnetars are still a big mystery in the universe. Not many magnetars are known and they are not well studied. With this one year project I want to get a better knowledge of the magnetars.

Principle investigator

My name is Kimberly Jongman, I am 23 years old and I am a master student at the Sterrekundig Instituut Utrecht. My field of interest is high energy astrophysics. I have a bachelor degree in physics with chosen courses on astrophysics. For my bachelor thesis I chose a high energy astrophysics subject on x-ray sources under the supervision of Prof. dr. F.W.M. Verbunt.

Project description

The project duration is one year. In this year I want to study magnetars, which is a subject in high energy astrophysics. By now only 21 magnetars are known. There is a theory on the evolution of magnetars, but this theory is not proven. For a better understanding we need more possibilities to analyze data. For example data extraction in multiple wavebands we could track down new magnetar candidates. These stars can then be studied better to find out what properties they have.

Innovative research aspects

My goal is to create an algorithm to analyze the data from satellites and telescopes in multiple wavebands, x-ray, radio and visible. Next I want to locate all magnetars and determine there properties. With this algorithm it will be possible to track down magnetars and make a map of the magnetars on a sky chart, which is then completely updated.

Project plan

The time for a master thesis is one year, or 10 months, starting September 1, 2011. First I will do background research for 2 months. Then there are 6 months to create the algorithm, verify it and discuss it in group meetings. Last I will have 2 months to write the thesis, with an additional month for making a poster for a conference.

Budget

Salary	€40000	
Office space	€6000	(12*€500)
Office supply	€5000	(computer, printer, software)
Total	€51000	

Contact details

Kimberly Jongman
Buys Ballotlaboratorium 701
Princetonplein 5, 3584CC Utrecht
k.jongman@students.uu.nl

Proposal Title	*Development of optical imaging techniques for molecular imaging*. Applications in biomedical and biology for preventing cancer,and neurological and cardiovascular diseases
Person who proposes	*Stavroula (Renia) Diamantopoulou ,* Masters Student
Contact	*Buys Ballot Laboratorium, Princetonplein 5, Utrecht University,Department of Astrophysics*
Date	4th of June 2011

This proposal is written for Nirvana Science Foreclosures (NFS) in order to initiate and complete research in the filed of the proposal stated above.

1.Biography of Principle Investigator

The principle investigator of this project is going to be the proposer mentioned above, Stavroula Diamantopoulou. She is studying Astrophysics and Space research at Utrecht University. She has obtained a 5 years bachelor diploma in applied Mathematics and Physics in National Technical University of Greece. As a bachelor thesis she had a research in measuring the ultraviolet radiation of the sun as well as the aerosol optical depth (AOD) using sun photometer and satellite data.

2.Summary

Molecular Imaging emerged in the early twenty-first century as a discipline at the intersection of molecular biology and *in vivo* imaging. It enables the visualisation of the cellular function and the follow-up of the molecular process in living organisms without perturbing them.

3.Project Description

The main scope of this project is to use MRI (Magnetic Resonance Imaging), Single photon emission computed tomography (SPECT), and Positron emission tomography (PET) to detect what is known as a predisease state or molecular states that occur before typical symptoms of a disease are detected.

4.Innovative Research Aspects

The multiple and numerous potentialities of this field are applicable to the diagnosis of diseases such as cancer, and neurological and cardiovascular diseases and how and whether these diseases are related to the aerosol particles that can be inhaled by humans or affect the human organisms in general.

5. Project Plan and Budget

- SWOT analysis to review the requirements, keep it as simple as possible. (find an institute-hospital that possess PET, MRI, SPECT)
- Project team meeting to clarify roles and responsibilities
- create draft plan, work breakdown structure, predict possible risks
- Communicate constantly with the members of the project team if needed control process changing.

Budget

Costs for MRI,PET, SPECT is huge but the main goal is that this project will be held in an institute that already has these devices.

Matlab license (there are free version of Matlab online), C++ and Labview (€ 2,749 LabVIEW Real-Time Module, Include 1 Year SSP), laptop for every member of the project team (1 person x € 1200= € 1200).

Experiments (€300-€2500 for each MRI test,depending upon which MRI procedure is performed,

€2500-€5000 for PET scan, €2500 for SPECT test)

Travel costs (€3000 because institutes like that are mainly in the USA)

Students salary (€18000 per year, 4 years= €72000) (total cost up to 240.000)