

Adopted at the ELGRA General Assembly on April 17th, 1991, Porz, Germany and accepted by the Vereins-Register Munich on Feb 8th 1993 under number 9702. Revised version adopted at the ELGRA General Assembly on April 3, 2003, Munich, Germany.

1. The „European Low Gravity Research Association, ELGRA“ is an international Association of European scientists and scientific groups concerned with the investigation of phenomena under low effective gravity. ELGRA is pursuing only non-profit objectives according to the section „Tax favoured purposes“ of the German tax law. The means of the Association can be used only for objectives defined in the Statutes. Members do not receive allowances from the means of the Association. No individual may be favoured either by payments not related to the objectives of the Association or by disproportionately high reimbursements. In case of dissolution or cessation of the Association or of abolition of its hitherto objectives the property of the Association is assigned either to a Public Corporation or to another „tax favoured“ Association with the purpose to be used, e.g., to promote scientific activities according to PARA 2 of these Statutes.

It has its seat in Munich and is listed in the register of associations.

#### 2. The objectives of the Association are:

- To encourage and promote research in Europe using low gravity conditions for the investigation of gravitational effects in various phenomena and technological processes.
- To encourage co-ordination of the European efforts in this area, in particular with regard to the definition, preparation and conduct of experiments in space.
- To promote interdisciplinary cooperation between research teams from various scientific disciplines.
- To promote the participation and active incorporation of students in space activities.
- To represent the common interest of its members.

#### 3. The association shall endeavour to achieve the objectives specified in PARA 2 by mechanisms which will include:

- The organisation of scientific conventions, conferences and colloquia.
- The provision of a forum for the discussion of research programmes.
- The promotion of the exchange and dissemination of information.
- Advising scientists and research teams
- The provision of information to national and European authorities and industrial firms, and in particular the aerospace industry.
- The setting up of committees for specific tasks.
- The encouraging and promoting the formation of National Associations.

#### 4. Membership:

- Membership can be granted to individuals as well as to corporate bodies, e.g., scientific Institutes and Laboratories, which are engaged in the field of activity of ELGRA.
- Student membership can be granted to any registered student expressing an interest in the field.
- The General Assembly of members shall decide whether an applicant for membership or student membership shall be accepted. An application requires the acceptance by the least a two-third majority of the General Assembly. This function may be delegated by the General Assembly to a membership committee.
- An application can be rejected without reasons being stated for such rejection.
- A member may leave the Association at the end of a calendar year. Six month notice must be given. The notice must be given to the

president in writing.

- The General Assembly shall decide under what conditions membership or student membership shall lapse.
- By a voting majority of at least 80%, the General Assembly can exclude a member, in particular if the prerequisites for membership are no longer met.

The president must submit in writing the proposal for exclusion to the member concerned at least two weeks before the General Assembly and must read out to the Meeting a statement by the member.

#### 5. Bodies of the Association:

The bodies of ELGRA are:

- The Management Committee
- The General Assembly of the members

#### 6. President and / Management Committee:

- The Management Committee shall consist of the President, Secretary and one Vice-President all of whom are legal representatives of ELGRA, and a number of other Members, this number to be determined by the General Assembly. The President and the Vice-President should represent the fields of Life and Physical Sciences.
- The President presides over the Association, represents it and administers it in agreement with the Management Committee. He chairs the meetings of the Management Committee, and the General Assembly. He is responsible for implementing the decisions of the General Assembly.
- The President, Secretary and Vice-President, henceforth known as the Officers, and the remainder of the Management Committee will be elected by the General Assembly by a simple majority in a secret ballot. They shall serve for two years and may be re-elected once for the same position.
- The Management Committee shall have the power to invite representatives of other European organisations to its own meetings or to the General Assembly, to serve in an advisory capacity only.
- The Management Committee shall convene at least once per year.

#### 7. General Assembly:

Each member can be represented by only one person at the General Assembly.

- The General Assembly shall be convened at least once every two years. Two months written notice of the meeting shall be given by the Secretary, and the proposed agenda shall be sent out not less than four weeks in advance.  
An Extraordinary General Assembly can be convened by the President or by 20% of the members.
- The Secretary General will draw up minutes of the General Assembly. The protocol of the General Assembly must be signed by the President.
- A quorum of the General Assembly shall be 20 members or 20% of the membership whichever number is the smaller.
- Unless provided otherwise, decisions shall be valid when adopted by a simple majority. The President will have a casting vote.
- Tasks of the General Assembly
  - Discussion and adoption of the working programme of ELGRA
  - Adoption of the minutes of the previous General Assembly.
  - Adoption of President's report. Adoption of Treasurer's report.
  - Election of the Officers or other members of the Management Committee.
  - Election of two auditors.



### • ELGRA 2003 Biennial Meeting and General Assembly

from K. Kemmerle

The biennial meeting 2003 was held in Munich from April 2 to 4, 2003. Local organizing had been done by Kayser-Threde staff: Dr. Kurt Kemmerle, Dr. Christoph Bartscher, Annette Witte, and Arlette Janssens. Support was given by Prof. Dr. Joachim Richter, RWTH Aachen.

With the "Künstlerhaus", opened 1900 by the Bavarian regent Luitpold, an agreeable and beautiful site could be found to host the meeting. Initially conceived as meeting point between artists and society, it now served as discussion forum between scientists of various disciplines out of the microgravity research domain. However, in this agreeable atmosphere all of them remained earth-bound.

Some information in numbers:

- 92 participants out of 12 nations
- 4 invited papers
  - N. Dimarcq: ACES: Atomic Clock Ensemble in Space
  - A. Cogoli: Cell Biology in Space: From Basic Science to Biotechnology
  - E. Brinckmann: Life and Physical Sciences and Space Station Utilization at ESA, Future Perspectives at a Difficult Time
  - T.L. Whateley: Microencapsulation in Microgravity
- 41 lectures
- 18 posters
- 8 sessions and poster session.

A small reception was given at Kayser-Threde on Wednesday evening with the two highlights:

- Wolfgang Engler's slide show of the Maxus 4 mission
- live telecom with the Texus/Maxus team in Kiruna, Sweden, when Maxus 5 had just flown successfully on April 1, 03 and the TEXUS 40 flight was in preparation. With the best wishes from the ELGRA meeting participants, it flew successfully on April 8, 03.



The students, winners of the competition, with Marianne Cogoli (middle).

On Thursday evening, the ELGRA General Assembly was held (see dedicated contribution in this newsletter).

It was followed by the banquet in the "Augustiner Keller", of course, with Munich beer out of wooden barrels and typical Bavarian food.



Here the ELGRA meeting participants were welcomed by Dr. Reinhard Wieczorek, director of the department and town councillor, as representative of the city of Munich.

In honour of his outstanding merits in biological µg-research and especially for his engagements in education (organiser of Erasmus Summer schools), Dr. Lewis Gregory Briarty was awarded with the ELGRA medal.

Vivid discussions and Bavarian fluid flow went long this evening, but nevertheless everybody was in a good shape at the Friday morning sessions.

When the participants had left on Friday evening, we had the good feeling that everybody had enjoyed his stay in Munich.



The ELGRA medal awarded to Dr. Lewis Gregory Briarty (right). Left: Marianne Cogoli. Middle: Michael Dreiseidler, University of Bonn and participant of the Erasmus Summer School co-organised by Dr. Briarty in Banyuls in 2002.

## • Summary of the 67<sup>th</sup> and 68<sup>th</sup> Management committee meetings

### 1. The 67<sup>th</sup> ELGRA Management Committee (MC) meeting was held at ESA-HQ in Paris on September 8-9th, 2003.

This meeting was the first meeting involving the new ELGRA Management Committee.

The main topics that were discussed were the following:

**Introduction from the President:** As also stated in the message addressed to the members after his appointment, the new President, Daniel Beysens, expresses its thanks and the pleasure for the possibility given to him to chair the Association. He wishes to work together to the MC and to the members to make ELGRA an efficient tool for the microgravity community.

During the last month he has been in contact with the former President (M. Cogoli) in order to exchange documentation and to ensure the due continuity to the action of the Association.

The President reports about the LPSAC meetings of September 2003.

**Financial report:** The financial status of the Association is reported by the Treasurer. ESA approved a support of 10000 € as forfeit for the ELGRA expenses in 2002 and the maximum support for 2003 will be negotiated with ESA by the President and the Treasurer.

**ELGRA web side:** The upgrading of the ELGRA web site was discussed. A MC commission composed by J. van Loon, V. Legué, D. Beysens and L. Liggieri is charged of the actuation of such upgrade.

**ELGRA meetings:** T. Karapantsios presents the operative and economic project for the organization of the ELGRA meeting 2005 in Santorini (Greece). The proposal is accepted by the MC. The meeting will be held during the second half of September. T. Karapantsios is appointed for the organization. He will provide a more detailed proposal at the next MC meeting.

To serve at the best the microgravity community ELGRA should increase its visibility in the international meetings. Several opportunities were reviewed (IAAF meeting, International Astronautical Conference in Bremen). Another meeting is the International Astronautical Conference in Bremen (September 29-October 3rd, 2003). A joint session with ELGRA representative is planned for the Spacebound Conference in Toronto initially planned during May 2003 and now re-scheduled in May 23rd-27th, 2004.

**Student context:** For the next ELGRA meeting a new student context will be organized. The target of selecting and supporting a student representative at the ELGRA meeting of about 10 teams should be pursued. At the meeting there will be a final selection of the winners (3 teams, for instance.) with the involvement of all members.

**Collaboration and publication:** The Japan Society of Microgravity Application (JASMA) contacted ELGRA with the aim of setting-up collaborations and ideas exchanges. The MC evaluates positively the relations with other microgravity related scientific organizations and D. Beysens will get into direct contact with the President of Jasma during

an imminent travel in Japan in order to discuss in detail possible joint initiatives.

Contacts will also be taken with other microgravity related associations agree similar initiatives. L. Liggieri will look for the contact points of these organizations.

The possibility for ELGRA to have a role in the publication of a scientific journal is discussed and positively evaluated. A MC commission composed by H. Kuhlman, T. Karapantsios and F. Strollo will explore the possibility of setting specific agreement with existing journals and will elaborate consequent proposals.

The possibility to organize summer schools in the field of Life and Physical Science will be explored by a MC commission composed by L. Liggieri, F. Strollo and V. Legué.

**ELGRA Newsletters:** The possibility to go into a more important publication than ELGRA Newsletter has to be checked. The new format should contain from now on the minutes of the MC meetings and feature articles by the invited speakers at the ELGRA meeting. Further than the letter of the President, the next issue should contain the extended abstract of the papers winner of the students context, the new Statutes, the minutes of the last General Assembly, an article about the status of the elaboration of the White Paper on EU space activity.

**EU White paper:** The ELGRA position stated after the Munich ELGRA meeting have been reported by B. Roux to the commission elaborating the White Paper.

After that a representative of ELGRA (D. Beysens, B. Roux, V. Shevtsova and J. van Loon), will be received by the President of ESA, J. Jacques Dordain, and by Luc Tytgat, Head of the Space Policy Unity at the EU commission, in order to explain and defend the point of view of the microgravity users community.

In spite microgravity research has not been included in the EU FP6 themes, the experience gained and the data collected about the possible network represented a positive outcome. The action of ELGRA in respect to the EU White Paper is also finalized to the recognition of the microgravity research as one of the field worth to consider inside the next EU FP (or in possible revisions/upgrade of the FP6). The database collected in this occasion could be made available for further initiatives.

### 2. The 68<sup>th</sup> ELGRA Management Committee Meeting began on March 30th, 2004 at 8:30 in the Seminar Room of the Institute of Fluid Mechanics and Heat Transfer of the Vienna Technical University, Resselgasse 3/2/1, 1040 Vienna.

The follow-up of actions was reported and discussed: In particular:

**Financial report:** About 50% of the membership dues for the year 2004 have arrived in the account by now.

Tax exemption of ELGRA has been approved by the financial authorities of Munich for the years 2001-2003. The treasurer explained the financial report which was approved by the MC.

**Publications:** According to the information of Microgravity Science

Technology (MST), it would cost approximately 10.000 € per year if MST will be distributed to all ELGRA members. In that case, the ELGRA Newsletter can be published as four pages in MST. In addition, two ELGRA members will join the editorial board of MST. The merging of ELGRA News with MST depends on the availability of additional support. This issue has to be clarified. The Santorini proceedings could be published in MST. One copy of MST for the Santorini participants should be free of charge. This point should be clarified as soon as possible, because this information is essential for the announcement of the Santorini ELGRA meeting.

**Next ELGRA Congress:** M Monici (University Of Firenze) has offered to organize the next Biennial Meeting and General Assembly in Firenze in 2007.

**ELGRA web site:** Updates have been identified for the ELGRA web site.

**New members:** OHB (Bremen) has become a new supporting member.

## • Minutes of ELGRA 2003 General Assembly

The 2003 ELGRA General Assembly starts on April 3rd, 2003 at 17:00 in the Kuenstlerhaus theatre, Munich - Germany

### Agenda

1. Opening by the president / Adoption of the agenda
2. Approval of the minutes of the previous General Assembly
3. President's report
4. Treasurer's report
5. Auditor's report
6. Discharge of the treasurer
7. Acceptance of new members
8. Change of statutes / Membership fee
9. Election of two Auditors
10. Election of management Committee Members
11. Any other business

### 1. Opening by the President / Adoption of the Agenda

The President opens the Assembly.  
32 full members are present, plus several associate members and guests.  
Upon request of the President the Assembly adopts the Agenda.

### 2. Approval of the minutes of the previous General Assembly

The minutes of the previous General Assembly, held in Banyuls-sur-Mer on September 26, 2001, are unanimously approved by the Assembly.

### 3. President's report

The President, Marianne Cogoli-Greuter, reports about the status of the Association and the work performed during the last term.

#### 3.1 Meetings of Management Committee

Since the last General Assembly, 4 meetings of the Management



Committee (MC) have been held. In agreement with the indications from the previous Assembly, the MC worked particularly on the preparation of the changes of the Statutes and of the Membership, on the definition of an Education policy, on the realisation of the ELGRA Student Context and on initiatives in respect of the 6th European Framework Programme, further than on the ordinary management of the Association. Discussions were also held on the future development of the Association and on fostering the representation role of ELGRA in respect of the members and of the microgravity community in general.

### 3.2 ELGRA Newsletter

The Newsletter publication is continued regularly. The last one (No. 3) took on a new and more professional look. Thanks for his work are expressed to the Editor Antonio Viviani.

### 3.3 Information to members

Since the last General Assembly members were contacted 18 times via e-mail, in order to inform and involve them in ESA, EU, and ELGRA initiatives, in the process of changes of the ELGRA Statutes, and in the ELGRA Meeting preparation.

### 3.4 Preparations for changes in the Statutes

The MC has worked together with the members to prepare the proposal for the change of Statutes that will be voted during this Assembly.

### 3.5 Preparation of the ELGRA Meeting 2003

The MC has worked in connection with the Local Organising Committee, to prepare the ELGRA Meeting 2003.

### 3.6 ELGRA Data Base

The structure of the ELGRA Members Database has been defined and about 30 contributions by the members arrived. After a brief discussion, it has been decided to publish this database on the Web, even with a limited number of records. The members are invited to send their records to the President. A decision on the technical tools for the publication will be taken soon.

### 3.7 Mail to Mr. K. Knott and Mr. G. Ruyters

ESA has been contacted recommending the agency not to cut back drastically the sounding rocket programme despite the 50% subscription of the ELIPS program.

### 3.8 EU Proposal for a Network of Excellence for EU FP6

ELGRA supported the preparation of a proposal of Networks of Excellence for the EU FP6. Microgravity activities have a remarkable relevance in the proposal, which refers to two main areas: life science, chaired by J. van Loon and physical science (mostly fluids), chaired by B. Roux.

### 3.9 Participation to ISS Petition

ELGRA sustained a petition addressed to NASA administration to support the consolidation of the ISS budget. The initiative - of Jack van Loon and Millie Hughes-Fulford - achieved a good success being signed by more than 500 people from 31 countries.

### 3.10 Student activity

During the last MC term, an increased attention has been paid to the theme of Education. In this respect, the important initiative of the ELGRA Student Contest

has been organised, starting from the opportunity offered by the ESA Student's parabolic flights.

### 3.11 ISPS/Spacebound 2003 Conference

ELGRA has been invited to chair a session of the ISPS/Spacebound Conference in Toronto: the major microgravity related event for 2003. However, this event has been cancelled, recently.

### 4. Treasurer report/ 5. Auditor report / 6. Discharge of the treasurer

The Treasurer, H. Kuhlmann reports on the financial status of the Association.

Unfortunately, ESA didn't grant its usual donation to ELGRA in 2001 due to a change of the funding policy. For the expenses in 2002 an invoice has been sent to ESA that should be paid very soon. Financial support for 2003 has been promised.

The last balance of the Association has been regularly sent to the German financial authorities for the approval of the waiver of tax-free regime granted to scientific associations.

The correct financial administration of the Association by the Treasurer during the period August 2001 - March 2003 is stated by the Auditors, H. Dittus and G. Pérbal.

The Assembly unanimously accepts the financial report and discharges the Treasurer.

### 7. Acceptance of new members

The status of the membership is presented (see attached Annex 2) and the new members are unanimously accepted by the Assembly.

### 8. Change of statutes / Membership fee

The proposed changes in the statute are presented by the President. It is verified that the full members present achieve the quorum needed to vote changes of the Statutes.

The proposed Statute changes are unanimously approved by the Assembly.

The new version of the Statutes is attached in Annex 3. According to the approved changes of the ELGRA Statutes, the following membership fees are also unanimously approved by the Assembly:

Ordinary Members	50.00 Euro
Supporting Members	600.00 Euro
Students	free

The changes will be effective from January 1, 2004.

### 9. Election of the Auditors

Auditors for the new term are named H. Dittus and E. Brinkmann.

### 10. Election of management Committee Members

According to the procedure proposed during the last MC and approved by the assembly and to be adopted from now on, the election is done in secret ballot in three turns. First the election of the president, then of the two vice-presidents and the General Secretary, and finally the election of the Treasurer and the MC members. The results of each turn are communicated before starting a new turn.

According to the above procedure the following Officers and MC members have been elected:

President:	D. Beysens	(23 votes)
vice-President:	F. Strollo	(25 votes)
vice-President:	T. Karapantsios	(25 votes)
General Secretary:	L. Liggieri	(22 votes)
Members:	V. Legué	(24 votes)
	M. Cogoli-Greuter	(25 votes)
	J. van Loon	(24 votes)
	H. Kuhlmann	(24 votes)
Treasurer:	K. Kemmerle	(25 votes)

### 11. Any other business

None

### The President closes the Assembly at 19:00

the ELGRA President	the ELGRA General Secretary
Marianne Cogoli-Greuter	Libero Liggieri



The former President Marianne Cogoli (right) with the new President Daniel Beysens (left).

## • LLESCA-SCF Artificial gravity generation

A. Ciurana, X. Geronès, I. Selga, and J. Solà

### I. INTRODUCTION

Stanley Kubrik once projected a spinning Space Station. In his film *2001 Space Odyssey* he imagined how to generate gravity outside The Earth; he thought that making a Space Station spinning around its revolution axis would create centrifugal force. Adjusting spinning speed and radius,

Earth's gravity would be emulated inside Station.

Obviously, Kubrik did not think about real implementation problems involved. We want to focus our study on some of these technical difficulties: What happens when people and cars move inside the Space Station? Will its spinning speed decrease? What about the homogeneity of the gravity perception across the platform? Is it possible to restore the initial state of the Station again?

Our main goal is to analyze the behavior of a centrifuga platform when its' gravity center is changing continuously. We want to check some control algorithms to restore gravity center in real time.

### II. MODUS OPERANDI

According to these proposals, we took part in 5<sup>th</sup> Parabolic Flight Campaign organized by ESA in Bordeaux.

We built a 30cm diameter centrifugal platform, called LLESCA. Inside LLESCA, there were two weights moving along platform's x-axis. One of them moved randomly in order to simulate *life* in a space station, changing the gravity center of the platform, and cause of it, changing the spinning axis too.

The Control Unit realized about this change by an accelerometer, and according to a control algorithm, moved the second weight in order to restore the platform to its original revolution axis. We wanted to check if a PID controller could be able to control Space Stations' spinning stability in real time.

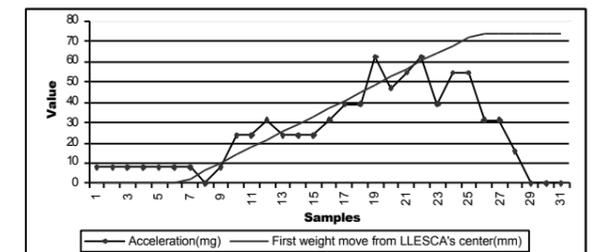


Fig. 1 Acquired data in parabola 21: three seconds after injection, first weight started moving linearly along LLESCA's x-axis. Center's acceleration response can be seen. Initial platform's spinning velocity was 1 rad/s.

Although we could not test our control algorithm in micro gravity due to onboard technical problems, we could acquire excellent data on platform's behavior when the first weight was moving (Fig. 1). Many simulations have been made from acquired data to determine which would have been the controller's behavior in micro gravity conditions. In the next few lines, we want to show you our analyzing procedure and the simulations result.

### III. CREATING MATHEMATICAL MODEL

Before we start simulating our Space Station's control algorithm, a





simulated by the two orthogonal toroids invaginated into the antennule of the crustacean. The movement of the fluid in these canals has been shown to displace thread hairs (Fig. 1) (M&F 99). Such movement stimulates the activity of bipolar neurones attached to the chorda. The system responds predominantly to angular acceleration, but is affected by gravity (1) In this experiment, the signal has been monitored from the oesophageal connective, more specifically from cells A (head up stimulus), C and D (head down stimulus).

By means of the 5<sup>th</sup> Student Parabolic Flight Campaign, two sets of 4 crabs were flown on successive days on a modified Airbus 300 ZERO G (Novespace, Merignac, Bordeaux) to investigate the effect of hypergravity and microgravity on the crustacean balancing system.

**Methods**

The crabs had a very thin insulated wire (0.125mm diameter) inserted close to their nervous system where it was possible to record electrical activity (nerve spikes) from large identified neurones which receive input directly from their balancing system. A mechanical plate constructed by the students oscillated the four crabs. Such oscillation was performed continuously at 0.3 Hz in the pitching plane with amplitude of c45 degrees. When crabs are in air, they give an extremely constant output to this sort of oscillation with one large cell responding to head up angular displacement and two large cells responding to head down angular displacement.

**Results**

The output of the nerve cells altered with an initial drop, followed in some recordings by a transient increase and decrease during the 1.8 G phase leading into free fall. During freefall there was a sharp drop in activity followed by a gradual return towards initial levels. During the 1.8G pull up phase The response either increased or remained the same initially, then dropped followed by a return over 30 – 40 seconds to initial levels (fig. 2).

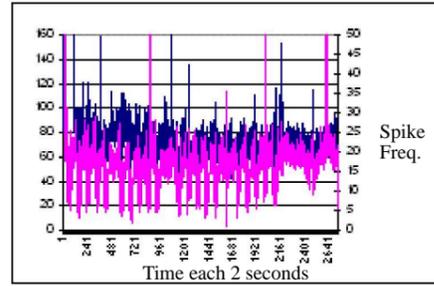


Figure 2- Head up cell (cell A) records for 2 crabs in second flight. Effect of 4 sets of 5 parabolas on the discharge pattern of equilibrium interneurons.

Responses were complex with head up and head down cells showing opposite effects during part of the parabola and showing similar changes in other parts of the parabola (fig. 3). The responses did not stabilize during the relatively short times of each of these phases. Despite the complexity, the changes in successive parabolas were virtually identical, allowing averaging of the response sequence (fig. 4). A possible confounding influence namely, the amplitude of the oscillation altering during the different phases, was easily dismissed since the changes in spike firing frequency were much greater than could be predicted from these small amplitude changes alone.

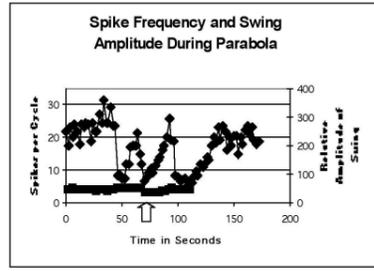


Figure 3- comparison of the plate amplitude and the spike frequency of Cells C and D during one parabola. There are small increases in amplitude which accurately show 1.8G and decreases which show 0G phases (arrow).

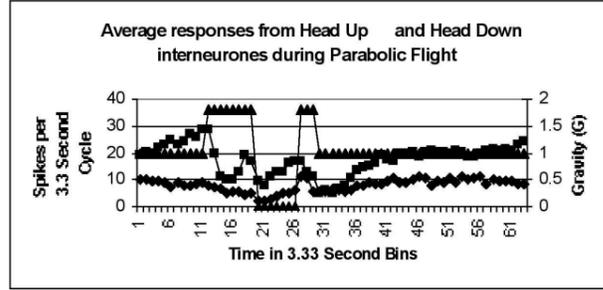


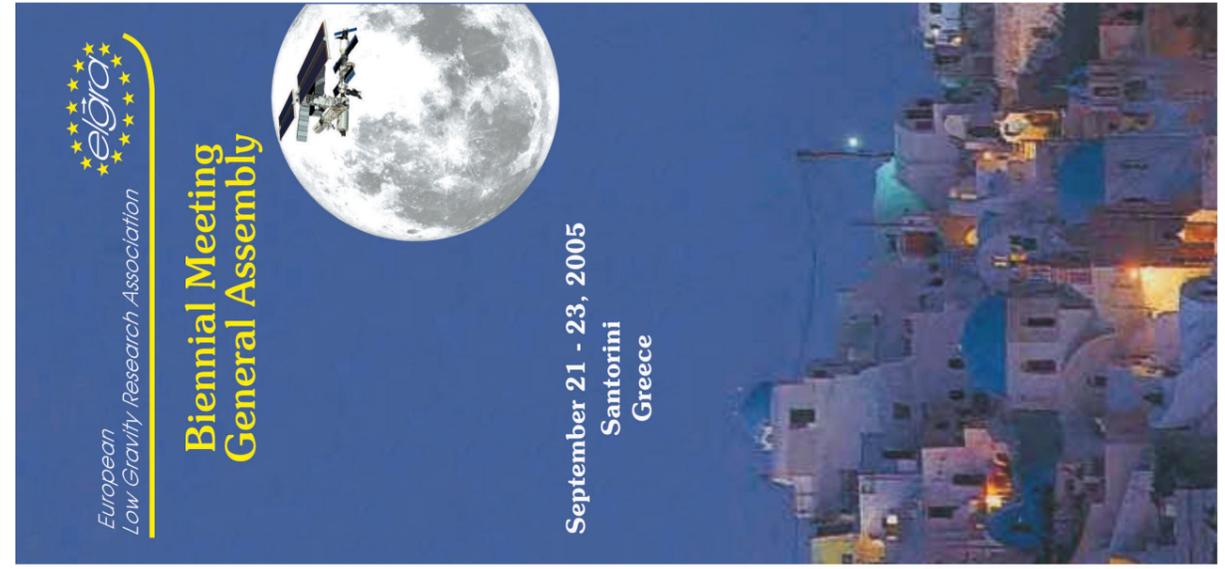
Figure 4- Average of responses from head up and head down data. Cell A, (lower trace) and cells C and D (upper trace). Gravity (triangles)

**Conclusions**

From this research is clear that the statocyst interneurons are affected by gravitational changes. It has been shown that the frequency of spikes seems to be reduced initially in 0g, possibly due to a slack in thread hair cells parking position. For this reason we were led to believe crabs might have disregarded the stimulus during initial phases of microgravity but responses returned after 2 seconds. Surprisingly, both phase and antiphase crabs showed same output during microgravity bouts. Therefore, the effect of gravitational changes in the balancing organ seems to be general. Moreover, this research has indicated those hypogravity/microgravity transition periods are of extreme interest for both head up and head down cell output. It would therefore be of enormous value to look further into this aspect by performing longer experiments in zero gravity using crabs as the model.

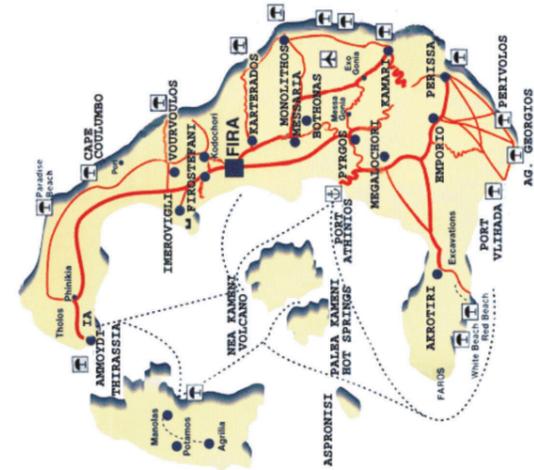
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If you do not expect the unexpected, you will not find it; for it is hard to be sought out and difficult

HERACLITUS



more info:  
[www.elgra.org](http://www.elgra.org)



ELGRA '05-Santorini, Greece  
September 21-23, 2005

**REGISTRATION FORM \*)**

Name: ..... Title: .....  
 First Name: .....  
 Address: .....  
 .....  
 Tel: ..... Fax: .....  
 E-mail: .....  
 Name of Accompanying Person(s): .....  
 ELGRA-member: Yes  No   
 Research area: .....  
 I intend to present a paper entitled: .....  
 Form of presentation: Oral  Poster   
 Remarks: .....

\*) If registration is not done electronically, please return this form by ordinary mail, Fax or E-mail to:

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**ELGRA**  
**2005 Biennial Meeting and General Assembly**  
**September 21st-23rd, 2005**  
**Santorini Island, Greece**

**Scientific/Organizing Committee**  
**(ELGRA Management Committee)**

Dr. Daniel Beysens  
 Prof. Felice Strollo  
 Dr. Thodoris Karapantsios  
 Dr. Libero Liggieri  
 Dr. Kurt Kennerle  
 Prof. Hendrik Kuhlmann  
 Dr. Marianne Cogoli-Greuter  
 Dr. Jack van Loon  
 Dr. Valerie Legue



Santorini is 35 minutes from Athens airport (4 flights per day) but there are also direct flights from many European cities. Santorini offers 3500 years of history visible through its archeological sites, museums, old churches and monasteries. Santorini is famous for its picturesque villages in the unique Cycladic white-and-blue architecture, hanging on the steep cliffs above the caldera.

**Call for Abstracts**

As in the past, the ELGRA Meeting 2005 is intended as a forum for scientific and technical research in microgravity including Life, Physical and Material Sciences, Fluid Physics, Physiology, Biotechnology, and others. Sufficient time will be reserved for discussions on the present status and the perspectives of microgravity research in view of the reduced flight opportunities and the delay of the International Space Station.

**One-page abstracts (A4) for oral or poster presentations are invited from now on.** The participation of students is particularly encouraged.



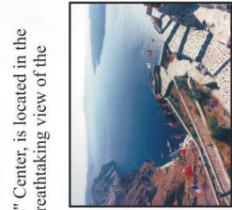
**Local Organizing Committee**

Dr. Thodoris Karapantsios - Chair  
 Ms. Christina Fofli - Managing Assistant  
 Mr. Nikolaos Divinis - Assistant  
 Ms. Eleni Kalogianni - Assistant



**Venue**

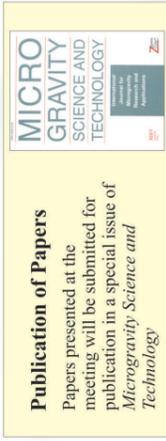
"P.M. Nomikos"  
 Conference Center  
 Fira (capital)  
 Santorini Island  
 Greece



The conference site, the "Nomikos" Center, is located in the capital of the island, Fira, with a breathtaking view of the caldera and the volcano. It offers a tasteful ambience for relaxed thinking, exchange of ideas and lobbying. Hotels and restaurants of different standards are within walking distance.



The social program of the meeting includes a visit to the excavations at Acheroti (ancient city buried under the volcano ashes) and an idyllic sunset cruise on a sailboat.



**Publication of Papers**

Papers presented at the meeting will be submitted for publication in a special issue of *Microgravity Science and Technology*

**Registration fees in Euros (€)**

ELGRA members: 250 (280)  
 Non-ELGRA members: 350 (390)  
 ELGRA membership + registration Students: 300 (340)  
 Accompanying persons: 150 (170)  
 130 (150)

**Early (Late)**

250 (280)  
 350 (390)  
 300 (340)  
 150 (170)  
 130 (150)

Registration fees can either be paid in advance by cheque or credit card (VISA, MASTER, DINERS) following the instructions given on: <http://www.elgra.org> or in cash on arrival. Please consult this web site for **Abstract Submission and Registration**.



**NEW ELGRA's STUDENT CONTEST**

**Benefits and Rules**

ELGRA (European Low Gravity Research Association) offers to undergraduate<sup>1</sup> students the possibility to present their recent research work performed under microgravity-related conditions to a broad community engaged in research in life and physical sciences in space. On this account, ELGRA invites student teams<sup>2</sup> to submit their work to the special Student Session that will take place during the next ELGRA Biennial Meeting in Santorini (Greece), September 21- 23, 2005.

All selected teams will be offered an honorary student membership to ELGRA for one year. Selected teams are expected to attend all three days of the meeting. Registration fees will be fully waived for the selected teams. In addition, students may apply for a financial support for travel and accommodation. Due to funding limitations early application is encouraged.

In addition, selected works will be automatically considered candidates for a distinction award that will be judged and announced during the meeting by a jury committee.

Further to the ELGRA Biennial Meeting, the following options of presentation will be offered:

1. A special page on ELGRA's website ([www.elgra.org](http://www.elgra.org))
2. ELGRA's Newsletter

Students interested in this activity should submit their work: (1) by an e-mail to ELGRA vice-president, Thodoris Karapantsios ([karapant@chem.auth.gr](mailto:karapant@chem.auth.gr)) (2) using the appropriate template in ELGRA web site. The work must be presented in a comprehensive way within two A4 pages both in PDF format. The first page must include an extended abstract with the title, authors' names and affiliations (plus the e-mail and phone of the corresponding author) appearing at the top. The second page must include plots, schematics or photos (all in Black & White) with appropriate captions. Details on the exact format of the text are given in ELGRA website.

Student teams must prepare a poster as well as a short oral presentation of about 5 minutes. In preparing their contribution students should keep in mind

1. Is the title informative and a reflection of the content?
2. Are the objectives clear and the incorporated assumptions valid?
3. Is the work properly organized and well written?
4. Are the approach, results and conclusions intelligible?
5. To what extent the interpretations/conclusions are supported by the data?
6. Are the plots/figures useful and all necessary? Are they of good quality?
7. Is the referencing relevant, up to date and accessible?

ELGRA maintains the right to judge on the production quality of any submitted work and either accept it as it is or ask for improvement or reject it. A scientific committee appointed by ELGRA will review the submitted works and notify students.

**Important dates**

Submission of abstracts: **Deadline March 31, 2005.**  
 Notification of Acceptance: **April 30, 2005.**  
 Registration: **May 31, 2005.**

**Notice:** Together with their work students must provide an official letter by their advisor stating clearly that he/she agrees with the participation of his students in ELGRA's activities and that there is no copyright protection against bringing their work in public.

<sup>1</sup> Undergraduate students at the time of the research.

<sup>2</sup> Each team can be represented by one or two students (more students can appear as co-authors in the submitted work).



18 - 25 July 2004.

35th COSPAR Scientific Assembly, Paris, France

July 25 - 30, 2004

30th International Symposium  
Chicago, IL

Sponsored by the Combustion Institute and the University of Illinois at Chicago  
 Contact: Professor Kenneth Brezinsky  
 Department of Mechanical and Industrial Engineering M/C 251  
 College of Engineering  
 University of Illinois at Chicago  
 842 W. Taylor Street  
 Chicago, IL 60607-7022, USA  
 Tel: 312-996-9430, Fax: 312-413-0447  
<http://www.combustion2004.org/>

June 23 - 23, 2004

7th Microgravity Fluid Physics and Transport Phenomena Conference  
Cleveland, OH

Sponsored by: The Physical Sciences Division of the NASA Office of Biological and Physical Research - and - NASA Microgravity Fluid Physics Discipline Working Group  
 Hosted by: NASA Glenn Research Center at Lewis Field - and - National Center for Microgravity Research on Fluids and Combustion  
 For technical information: Dr. Bhim Singh, NASA Glenn  
 Tel: (216) 433-5396  
 e-mail: [Bhim.S.Singh@grc.nasa.gov](mailto:Bhim.S.Singh@grc.nasa.gov)  
 For logistics information: Christine R. Gorecki, NCMR  
 Tel: (216) 433-2851  
 e-mail: [Christine.R.Gorecki@grc.nasa.gov](mailto:Christine.R.Gorecki@grc.nasa.gov)  
 For housing and registration: Cynthia Rosenberger, NCMR  
 Tel: (216) 368-0748  
 e-mail: [crosenberger@ncmr.org](mailto:crosenberger@ncmr.org)  
 URL: <http://www.ncmr.org/events/fluids2004/>

September 12-15, 2004

7th Drop Tower Days and Catapult Inauguration,  
Bremen, Germany

International workshop on short-term experiments under strongly reduced gravity conditions  
 Registration:  
<http://www.zarm.uni-bremen.de/5conferences/dtd2004/index.htm>

October 4 - 8, 2004

55th International Astronautical Congress 2004  
Vancouver, Canada

Sponsored by the Canadian Aeronautics and Space Institute  
 IAC 2004 Secretariat:  
 International Conference Services  
 604 - 850 West Hastings St.,  
 Vancouver, BC Canada  
 V6C 1E1  
 Contact: Lynn Webb  
 Tel: 604-681-2153, Fax: 604-681-1049  
 e-mail: [congress@iac2004.ca](mailto:congress@iac2004.ca)  
 URL: <http://www.iac2004.ca>  
 Papers due: February 20, 2004

November 9-12, 2004

Annual Meeting of the American Society of Gravitational and Space Biology,  
New York USA

Annual Meeting of the American Society of Gravitational and Space Biology <http://asgsb.indstate.edu/>  
 ASGSB Executive Director Tom Scott: [tscott@email.unc.edu](mailto:tscott@email.unc.edu)  
 URL: [www.ASGSB.org](http://www.ASGSB.org) 2004 Meeting page

43rd AIAA Aerospace Sciences Meeting and Exhibit  
Reno, Nevada

Sponsored by: American Institute of Aeronautics and Astronautics (AIAA) Sponsored by the Microgravity and Space Processes Technical Committee  
 Contact: Kurt Sacksteder  
 NASA Glenn Research Center  
 Lewis Field  
 21000 Brookpark Rd.  
 Cleveland, OH 44135  
 Tel: 216-433-8308, Fax: 216-977-7065  
 e-mail: [Kurt.R.Sacksteder@nasa.gov](mailto:Kurt.R.Sacksteder@nasa.gov)

Jan 10-13, 2005

March 17-19, 2005

First IAA Conference Impact of Space on Society,  
Budapest, Hungary

Sponsored by: the International Academy of Astronautics  
 URL: <http://www.iaa-net.org>

May 22-25, 2005

15th IAA Humans in Space Symposium  
Benefits of Human Presence in Space. Historical, scientific, medical, cultural, and political aspects  
Graz / Austria

URL: <http://www.uni-graz.at/space2005/>  
 Chair: Prof. H. Hinghofer-Szalkay  
 Organized by the Institute for Adaptive and Spaceflight Physiology (IAP)

Summer 2005 - TBD

Microgravity Combustion Science Workshop  
Cleveland, OH

Sponsored by: The Physical Sciences Division of the NASA Office of Biological and Physical Research - and - NASA Microgravity Fluid Physics Discipline Working Group  
 Hosted by: NASA Glenn Research Center at Lewis Field - and - National Center for Microgravity Research on Fluids and Combustion

27 June-1 July, 2005

XVIIth European Chemistry at Interfaces Conference (ECIC-XVII),  
Loughborough, UK.

The conference hosts a session devoted to microgravity, chaired by L. Liggieri and T. Karapantsios.  
 Contact: Victor M Starov, Department of Chemical Engineering, Loughborough University, Loughborough, Leicestershire, LE11 3TU, UK. Phone: +44-(0)1509-222508, fax +44-(0)1509-223923, e-mail: [V.M.Starov@lboro.ac.uk](mailto:V.M.Starov@lboro.ac.uk)  
 for more information <http://www-staff.lboro.ac.uk/~cgvms/>.

October 16 -21, 2005

56th International Astronautical Congress 2005,  
Fukuoka, Japan

Japanese Society of Aeronautics and Space Sciences  
 Chairs: Prof. Michikata Kono  
 University of Tokoyo and Dr. Hiroki Matsuo  
 Commissioner, Space Activities Commission of Japan  
 URL: <http://www.iafastro.com/>

## MEMBERSHIP APPLICATION FORM

 STUDENT  
 FREE

 REGULAR  
 ¥ 50,00

 SUPPORTING  
 ¥ 600,00

Name: .....

Surname: .....

Professional status: .....

Field of activity: .....

Affiliation: .....

Mailing address: .....

Phone: .....

Fax: .....

E-mail: .....

Date and place: .....

Signature: .....

Please fill, sign, and send to the ELGRA President:

Dr. D. Beysens, ELGRA President  
 CEA-ESEME, ESPCI-PMMH  
 10, rue Vauquelin  
 F-75231 Paris Cedex 05 (France)

