The Nano Science and Technology program was launched in 2004. The bar plot below depicts the enrollment rates in years 2004-2011.

The Nano Science and Technology program was for the first year. Additionally, the support will be granted for applicants who receive a Ph.D. student Fellowship. The amount of the support will be under the discretion of the advisor.

Four months after they receive their student I.D., international students are eligible for Taiwan's National Health Insurance Program. The students are expected to pay the same premium as all the Taiwan citizens and will be entitled to the same medical coverage.

**Registration Day.** Partial subsidies for the tuition fees will later be provided (by Academia Sinica) to all international students who perform well academically. The academic performance of each student will be reviewed by the Academic Committee every year. The Committee may extend to two more years for those students who perform well academically. The academic performance of each student will be reviewed by the Academic Committee every year. The Committee may decide to reduce the student's stipend level if he/ her performance is less satisfactory. In subsequent years, the financial support will be provided by the student's thesis advisor with his/her research grant.

The payment of tuition fees (basic fee + credits fee, about NT$58,000/US$1,800 per semester) for international students should be made on Student Registration Day. Partial subsidies for the tuition fees will later be provided (by Academia Sinica) to all international students. Meals are available on campus at the Activity Center Cafeteria, the Cafe, the Chinese Restaurant, and the Western Restaurant at modest costs. Various types of local cuisines are also available at off-campus cafeterias and restaurants within walking distance and at affordable costs.

**Medical Insurance**

Up to 2011, 70 students from 19 countries are enrolled. The pie plot below shows the distribution of nationalities of these students.

**TIGP Dormitory**

The payment of tuition fees (basic fee + credits fee, about NT$58,000/US$1,800 per semester) for international students should be made on Student Registration Day. Partial subsidies for the tuition fees will later be provided (by Academia Sinica) to all international students. Meals are available on campus at the Activity Center Cafeteria, the Cafe, the Chinese Restaurant, and the Western Restaurant at modest costs. Various types of local cuisines are also available at off-campus cafeterias and restaurants within walking distance and at affordable costs.

**Living and Housing Costs**

Options include on-campus housing and off-campus housing. On-campus self-catering dormitory provides a small study bedroom is available to TIGP students at reasonable costs (for details, please visit our website at http://tigp.sinica.edu.tw/housing.html). Off-campus private housing is generally more expensive. Rents for off-campus apartments range from NT$ 5,000 - 10,000 per month. Meals are available on campus at the Activity Center Cafeteria, the Cafe, the Chinese Restaurant, and the Western Restaurant at modest costs. Various types of local cuisines are also available at off-campus cafeterias and restaurants within walking distance and at affordable costs.

**For information concerning this program, please contact:**

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Institute of Physics, Academia Sinica
Tel.: 886-2-2789-8794
Fax: 886-2-2789-8794
E-mail: chdsinh@phys.sinica.edu.tw

**For general information concerning TIGP, please contact:**

Ms. Nancy Yang
Administrative Assistant
Taiwan International Graduate Program
Tel.: 886-2-2789-8050
Fax: 886-2-2789-8944
E-mail: nancyy@gate.sinica.edu.tw
TIGP website: http://tigp.sinica.edu.tw/

**Correspondence and Information**

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**Student Status and Degree Conferral Policy**

Based on the Regulations of the Ministry of Education in Taiwan, students will officially register with our participating universities, National Taiwan University and National Tsing Hua University, depending on the particular program. Upon completion of our program, each student will be conferred a Ph.D. degree by the participating universities. The number of total students admitted to “Nano Science and Technology” and Technology program is divided into three categories, namely, “Physics-oriented”, “Chemistry-oriented” and “Engineering-oriented” sub-programs. The number of total students admitted to “Nano Science and Technology” Program every year is limited to twenty. The drawing below shows the number of students that can be recruited in each sub-program. Currently, these students are international students with reasonable proficiency in the use of the English language. However, highly qualified Taiwan students (up to 10 people) with adequate English proficiency are also considered. These students may ultimately elect to do their thesis research with affiliated faculty whose principal appointments are associated with the participating research universities.

**Taiwan International Graduate Program (TIGP)**

Academia Sinica has established the Taiwan International Graduate Program in collaboration with a consortium of several key research universities in Taiwan. The purpose of the program is to develop the research manpower pool in these modern multidisciplinary research fields that are important in the future economical and social development and to enhance the innovative potential and academic standards of research in these related fields. TIGP will offer Ph.D. programs in only selected disciplines to be agreed upon between Academia Sinica and these research universities. It is the intent of the Program to offer Ph.D. education programs only in interdisciplinary areas in the physical sciences, applied sciences, engineering, biology, and agricultural and social sciences, and health and medical sciences, and humanities and social sciences. Academia Sinica assumes principal oversight of the academic programs of the Program, and provides the intellectual leadership, the research resources, and the research and physical facilities. Qualified faculty members of the participating research universities are involved in various programs as affiliated members of the Program, and participate in the teaching of courses, supervision of research, and mentoring of the international graduate students.

**Virtual Program on “Nano Science and Technology”**

Within this context, the graduate program on “Nano Science and Technology” is designed to offer specific training and research opportunities to Ph.D. students who are interested in the following areas: characterization of nanomaterials and nanostuctures, nanomaterials and nanotechnologies, theoretical modeling, nanodevices and nanotechonology. This option is a collaborative effort among the Academia Sinica, National Taiwan University and National Tsing Hua University. In accordance with these research areas, the Nano Science and Technology program is divided into three categories, namely, “Physics-oriented”, “Chemistry-oriented” and “Engineering-oriented” sub-programs. The number of total students admitted to “Nano Science and Technology” Program every year is limited to twenty. The drawing below shows the number of students that can be recruited in each sub-program. Currently, these students are international students with reasonable proficiency in the use of the English language. However, highly qualified Taiwan students (up to 10 people) with adequate English proficiency are also considered. These students may ultimately elect to do their thesis research with affiliated faculty whose principal appointments are associated with the participating research universities.

**Taiwan International Graduate Program Nano Science and Technology Program**

The Taiwan International Graduate Program in Nano Science and Technology (TIGP) is an interdisciplinary educational program that focuses on the research and development of innovative technologies and materials in the fields of nanoscience and nanotechnology. The program aims to provide Ph.D. candidates with an opportunity to conduct research at one of the participating institutions in Taiwan, and to gain expertise in areas such as nanomaterials, nanodevices, and nanotechnology.

**Taiwan International Graduate Program Nano Science and Technology Program**

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Together with the above facilities, diverse expertise, and, more importantly, close collaboration among scientists and engineers of all participating units, the present graduate program provides students with an environment to develop their research interest, and to develop their creativity and skills in problem defining and problem solving.

Characterization of nanostructures

Studies of thermal, optical, electronic magnetic properties and surface structure and stability of the nanomaterials give a feedback to the synthesis process, allowing nanomaterials to be fine-tuned. The characterization tools include scanning probe microscopy, electron microscopy, calorimetry, magnetic measurements, and various spectroscopy, such as photoelectron spectroscopy, Auger electron spectroscopy, Raman spectroscopy, photo- and cathode-luminescence, etc. In addition, electrical transport, optical, magnetic field dependent transport under high-field and low-temperature, as well as field emission from tips made of various materials are carried out.

Theoretical modeling

Theoretical studies of electrical and thermal conduction properties and non-linear optical properties provide our understanding about the synthesized nanomaterials and may serve as a guide for the future directions. Chemical properties such as catalytic activities, formation mechanism, chemical reactions and other rate processes are also investigated. The theoretical methods employed include ab initio and molecular dynamics calculations, path-integral method, and density functional theories.

Fabrication of nanodevices

Fabrication and characterization of a variety of nanodevices and electric components associated with photonic, molecular electronic, spintronics, superconducting devices, micro- and nano-mechanics, biosensors pave the way for future applications. Various techniques for monolithic and hybrid integration of the key components into device modules and subsystems are developed.

Characterization of cell and molecular structures

Advanced biosensing techniques using nanobeam X-ray, phase-contrast/nanowire transmission electron microscopy, super-resolution fluorescence and non-fluorescence-based optical imaging, scanning probe microscopy are employed to study behaviors of cells and other biological components. He also exploits various types of cell imaging and biological applications of colloidal, fluidic, plasmonic, and polymeric nanostructures for biosensing.

Research Topics

Synthesis of nano structures composed of nanomaterials

Synthesis of nanomaterials such as quantum dots, nanotubes and nanowires, quantum wells, porous materials, nanocomposites, magnetic materials, surface nanostructures, and conducting molecules lays the foundation for further studies. National designs of these materials by means of chemical synthesis and fabrication technique an atomic scale, chemical vapor deposition, vacuum deposition, molecular beam epitaxy, field assisted oxidation, solvolithothetical method, sol-gel method, and self-assembly to produce nanomaterials of specific composition, size, shape, structure, and functionality.

Characterization of nanostructures

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● Synthesis of nano structures composed of diverse materials
Synthesis of nanostructures such as quantum dots, nanoparticles and nanotubes, quantum wells, porous materials, nanocomposites, magnetic materials, surface nanostructures, and conducting molecules lay the foundation of nanotechnology. Rational designs of these materials by means of chemical synthesis and fabrication techniques are also required to produce nanomaterials of specific composition, size, shape, structure, and functionality.

Characterization of nanostructures
Studies of thermal, optical, electronic, magnetic properties and surface structure are all required as part of the student's work. The nanostructures give a feedback to the synthesis process and also serve as characterization tools. Techniques such as scannng probe microscopy, electronic microscopy, calorimetry, magnetic analysis and non-destructive key photoelectronic spectroscopy, Auger electron spectroscopy, Raman spectroscopy, photo- and cathode-luminescence, etc. in addition, electrical transport measurement, time-resolved, single-particle transport under high-field and low-temperature, as well as field emission from tips of various materials are carried out.

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Exploration of nanodevices
Fabrication and characterization of a variety of nanodevices and electric components associated with photonic and electronic devices, electronics, spintronics, superconducting devices, micro- and nano-mechanics, biosensors pave the way for future applications. Various techniques for monolithic and hybrid integration of line components into device modules and subsystems are explored. It includes the advanced organic chemistry, Introduction to Nano-biophotonics, Advanced Inorganic Chemistry, Physical Chemistry, Advanced Analytical Chemistry, Advanced Chemistry of Materials. Teaching Assistant and Chinese Language teaching assistant an essential part of the TIGP curriculum. The student is trained to serve as a teaching assistant for at least one semester. Also, in order to help the international students in their daily life communication with the local people, we offer a required one-year course in Mandarin Chinese.

Research Topics
The program emphasizes research training and developing one’s self-reliance and self-confidence for independent work. In the Nano Science and Technology Program, faculty members will take turns to serve as mentors for newcomers until the student have chosen their thesis advisors. The program adopts a team-teaching system in which each faculty member provides expert input to the research advisor. Each letter comments on the applicant's personal characteristics, intellectual abilities, potential for independent work, and personal goals. The letters should be entitled by the individual who will supervise the research work of a number of laboratories before signing up for a specific full-time position. The process might involve attending a series of seminars or meetings to discuss the research of a series of laboratory rotations. Although every effort will be made to follow the student's choice of thesis advisor, the Graduate Study Committee of the institute may require the student to take numerous exams to further the final selection of thesis advisor.

Qualifying Written Examination
A student seeking admission to the Ph.D. candidacy must take a qualifying written examination according to the regulations of each participating institution. Students who fail to meet the requirement will be disqualified for staying in the Program.

Qualifying Examination
The oral examination, which is held after students pass the written examination, is conducted predominantly on a research proposal submitted by the student. However, before presenting the proposal to the examining committee, the student should be prepared to discuss with the committee members their research progress and abilities for the thesis work, including relevant literature, understanding of results, and will meet the requirement will be disqualified for staying in the Program.

Advancement to Candidacy
The criteria for advancement to candidacy include: (1) submitting one of the following proof is strong enough to support the application. (a) TOEFL: scores 550 on the paper-based (21 or higher) or 80 on the internet-based TOEFL (TOEFL iBT) or higher (http://www.ielts.org/ielts-code-name are: 7143 Academia Sinica) (b) IELTS: applicants in Taiwan may take the General Paper-based TOEFL, or TOEFL iBT, or the new internet-based TOEFL (TOEFL iBT) or higher (http://www.ielts.org/ielts-code-name are: 7143 Academia Sinica). This proof should be submitted by the Office of Registrar.

(4) Three letters of recommendation
These letters might be obtained from the home institution or another institution.

Admission to the Ph.D. Program
The program admits students to the fall semester only. Application materials are available in the TIGP website. The deadlines for the Fall, March 31, 2012. Students (either international students or students from Taiwan) with a M.S. degree from an accredited institution may be admitted to the chemistry-oriented and physics-oriented sub-programs. Selection of prospective students is made at application. The following criteria are used to evaluate applicants for qualifications for admission:

1. Formal undergraduate and graduate academic records or transcripts
2. Graduate Record Examination (GRE) scores in General Test

GRE is highly recommended. However, an applicant who scores below the 50th percentile may submit additional criteria for committee evaluation. The GRE Subject Test is optional and may be waived. It is recommended GRE subject test: one of the following subjects: Chemistry, Physics, Mathematics, or Biology is strongly recommended. GRE substitution: If under special circumstances the test is not taken, some proof of applicant's competency might be considered. This proof should be more than just recommendation letters and transcripts for local, national level, publications, certificates, records, exam scores of national or international level, scientific activities, etc. will be helpful. The admissions committee will determine whether the student is strong enough to support the applicant's entry.

3. English proficiency
Applicants whose first or native language is not English are required to have a minimum GRE test performance. The GRE test scores are strongly recommended.

(2) TOEFL: scores 550 on the paper-based (21 or higher) or 80 on the internet-based TOEFL (TOEFL iBT) or higher. (b) IELTS: applicants in Taiwan may take the General TOEFL, the new internet-based TOEFL (TOEFL iBT) or higher. (http://www.ielts.org/ielts-code-name are: 7143 Academia Sinica).
Together with the above facilities, diverse expertise, and, more importantly, close collaboration among scientists and engineers of all participating units, the program provides opportunities to conduct cutting-edge research, and to develop their creativity and skills in an environment that promotes problem solving.

Characterization of nanomaterials

Studies of thermal, optical, electronic, magnetic properties and surface structures will be carried out to provide fundamental understanding about the synthesized nanomaterials and may serve as a guide for the future directions. Chemical properties such as cata lytic activities, formation mechanism, chemical reactions and other rate processes are also investigated. The theoretical methods employed include ab initio and molecular dynamics calculations, path-integral method, and density functional theories.

Epitaxy of nanodevices

Fabrication and characterization of a variety of nanodevices and electronic components associated with photonic, electronic, optoelectronic, spintronics, superconducting devices, micro- and nano-mechanics, biosensors pave the way for future applications. Various techniques for monolithic and hybrid integration of these components into device modules and subsystems are developed.

Nanobiotechnology

Advanced imaging techniques using nanobeam X-rays, phase-contrast nanoscopy, scanning electron microscopy, super-high resolution fluorescence and non-fluorescence based optical imaging, scanning probe microscopy are employed to study behaviors of cells and molecules. The program also emphasizes practical applications of colloidal, fluidic, plasmonic, and polymeric nanoparticles for biosensing.

Academia Sinica

Institute of Chemistry

National Taiwan University

Department of Chemical Engineering

Research Center for Applied Sciences

Department of Physics

Department of Engineering and System Science

Center for Condensed Matter Sciences

Graduate Record Examination (GRE) scores in General Test

GRE is highly recommended. However, an applicant who fails to meet this requirement may submit additional criteria for committee evaluation. GRE has three sections: (1) Verbal, (2) Quantitative, and (3) Analytical Writing.

English proficiency

(4) Three letters of recommendation

Each letter comments on the applicant's personal character, and qualifications for independent study, including intellectual ability, research potential, and social and extracurricular activities. One of the letters of recommendation must be provided by the applicant's advisor.

(5) Statement of purpose (plan for graduate study in English)

The application submitted will not be returned to applicants under any circumstances. The complete application material should be received by the Office of Admissions before March 31, 2012. Application should be sent to:

Admissions Office
Taiwan International Graduate Program
No. 126, Sec. 3, Neihu Road
Nanking, Taipei 11529 Taiwan

For online application, please visit: http://tigp.ntu.edu.tw/tigp/
The Nan Science and Technology program was launched in 2004. The bar plot below depicts the enrollment rates in years 2004-2011.

Distribution of Students Nationalities in Nano Science and Technology program

Student Entry National Registry Policy

Based on the Regulations of the Ministry of Education in Taiwan, students will officially register with their partner universities, National Taiwan University and National Tsing Hua University, depending on the particular program. Upon completion of our program, each student will be conferred a Ph.D. degree by the partner university and a certificate jointly signed by the President of Academia Sinica and the Director of TIGP.

Goal of Study

The payment of tuition fees (basic fee + credits fee, about NT$5,000 – 15,000 per month) will be made on Student Registration Day. Partial subsidies for the tuition fees are available to all international students at reasonable costs (for details, please visit our website at http://tigp.sinica.edu.tw/housing.html). Off-campus private housing is generally more expensive. Rents for off-campus apartments range from NT$ 5,000 – 15,000 per month.

Medical Insurance

Opportunities for on-campus housing and off-campus housing. On-campus self-catering student dormitory provides three meals per day in the dormitory cafeteria. Meals are available on campus at the Activity Center Cafeteria, the Cafe, the Chinese Restaurant, and the Western Restaurant at modest costs. Various types of local cuisines are also available at off-campus cafeterias and restaurants within walking distance and at affordable costs.

Living and Housing Costs

This program is sponsored by Academia Sinica, National Taiwan University and National Tsing Hua University. In accordance with these research areas, the Nano Science and Technology program is divided into three categories, namely, “Physics-oriented”, “Chemistry-oriented” and “Engineering-oriented” sub-programs. The number of total students admitted to “Nano Science and Technology” Program every year is limited to twenty. The drawing below shows the number of students that can be recruited in each sub-program. The number of students is adjustable according to the number of international students with reasonable proficiency in the use of the English language. However, highly qualified Taiwan students (up to 10 people) with adequate English proficiency are also considered. These students may ultimately elect to do their thesis research with affiliated faculty whose principal appointments are associated with the participating research universities.

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Academia Sinica has established the Taiwan International Graduate Program (TIGP) in collaboration with a consortium of several key research universities in Taiwan. The purpose of the program is to develop the research manpower pool in those modern multidisciplinary fields that are important in the future economical and social development and to enhance the innovative potential and academic standards of research in these and related fields. TIGP will offer Ph.D. programs in only selected disciplines to be agreed upon between Academia Sinica and these research universities. It is the intent of the Program to offer Ph.D. education programs only in interdisciplinary areas in the physical sciences, applied sciences, engineering and life sciences, health and medical sciences, and humanities and social sciences. Academia Sinica assumes principal oversight of the academic options of the Program, and provides the intellectual leadership, the research resources, and the research and physical facilities. Qualified faculty members of the participating research universities are involved in various programs as affiliated faculty of the Program, and participate in the teaching of courses, supervision of research, and mentoring of the international graduate students.

For information concerning this program, please contact:

For information concerning TIGP, please contact:
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Taiwan International Graduate Program
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TIGP Program on “Nano Science and Technology”

Within this context, the graduate program on “Nano Science and Technology” is designed to offer specific training and research opportunities to Ph.D. students who are interested in the following areas: characterization of nanomaterials and nanostuctures, new nanomaterials and structures, theoretical modeling, nanodevices and engineering and nano-biotechnology. This option is a collaborative effort among the Academia Sinica, National Taiwan University and National Tsing Hua University. In accordance with these research areas, the Nano Science and Technology program is divided into three categories, namely, “Physics-oriented”, “Chemistry-oriented” and “Engineering-oriented” sub-programs. The number of total students admitted to “Nano Science and Technology” Program every year is limited to twenty. The drawing below shows the number of students that can be recruited in each sub-program. The number of students is adjustable according to the number of international students with reasonable proficiency in the use of the English language. However, highly qualified Taiwan students (up to 10 people) with adequate English proficiency are also considered. These students may ultimately elect to do their thesis research with affiliated faculty whose principal appointments are associated with the participating research universities.

Taiwan International Graduate Program (TIGP)

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Taiwan International Graduate Program
Nano Science and Technology Program

Three sub-programs and targeted number of students in a year in each sub-program

A whole array of laboratory equipment and facility for teaching and research are available within the participating units. The following is a list of some examples — device fabrication facilities: electron beam lithography, reactive ion etching machines, ion milling machine, nanoparticle spray system. Inspection and characterization instruments: scanning electron microscope, scanning luminescence microscope, high resolution transmission electron microscope, atomic force microscope, magnetic force microscope, near-field scanning optical microscope, micro-Raman/photoluminescence microscope, ESCA/XPS/AA spectroscopy, ultra-fast laser microscope, and measurement facilities such as automatic surface plasma resonance-based biosensor, microwave instruments.

Taiwan International Graduate Program
Nano Science and Technology Program

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The Nano Science and Technology program was launched in 2004. The bar plot below depicts the enrollment rates in years 2004-2011.

- The Nano Science and Technology program was launched in 2004.
- The amount of the support will be under the discretion of the advisor.
- The stipend levels are about US$11,000.
- Fellowship will be granted for applicants who receive international students.
- The payment of tuition fees (basic fee + credits cost) for domestic students range from NT$5,000 – 15,000 per month.
- Cafeterias and restaurants within walking distance of local cuisines are also available at off-campus housing.
- Cafeteria, the Cafe, the Chinese Restaurant, and the Western Restaurant at modest costs.
- Various types of local cuisines are also available at off-campus cafeterias and restaurants within walking distance and at affordable costs.

**Distribution of Students’ Nationalities in Nano Science and Technology Program**

- Up to 2011, 70 students from 19 countries are enrolled.
- The pie plot below shows the distribution of nationalities of these students.

**Fee Structure**

- Tuition fee, about NT$58,000/US$1,800 per semester
- Room and board: NT$5,000 – 15,000 per month
- Cafeterias and restaurants within walking distance of local cuisines are also available at off-campus housing.

**Medical Insurance**

- Off-campus private housing is generally more expensive. Rents for off-campus apartments range from NT$10,000 – 20,000 per month.
- Every TIGP student is entitled to the same medical coverage.
- Students who do not participate in the University’s health insurance plan must pay the same premium as all the Taiwan citizens and are covered by the health regulations of the advisor.
- Students who are awarded TIGP fellowships will be entitled to the same medical coverage.

For information concerning this program, please contact:

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**Correspondence and Information**

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**For information concerning this program, please contact:**

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  - Tel: 886-2-2789-8794
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**Student Selection and Nationality Policy**

- Based on the Regulations of the Ministry of Education in Taiwan, students will officially register with our partner universities, National Taiwan University and National Tsing Hua University, depending on the particular program. Upon completion of our program, each student will be conferred a Ph.D. degree by the partner university and a certificate jointly signed by the President of Academia Sinica and the Director of TIGP.

**Field of Study**

- The payment of tuition fees (basic fee + credits fee, about NT$50,000/US$1,800 per semester) for international students should be made on Student Registration Day. Partial subsidies for the tuition fees will be provided by (Academia Sinica) to all international students.

**Fellowship Support and Stipends**

- Fellowship will be granted for applicants who receive admission. The stipend levels are about US$11,000 for the first year. Additionally, the support will be extended to two more years for those students who perform well academically. The academic performance of each student will be reviewed by the Academic Committee every year. The Committee may decide to reduce the stipend, stipend level based if his or her performance is less satisfactory. In subsequent years, the financial support will be provided by the student’s thesis advisor with future research grant. The amount of the support will be under the discretion of the advisor.

**Medical Insurance**

- The amount of the support will be under the discretion of the advisor.
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