

**Memorandum of Understanding  
for the Dual International Masters Program:**

**InMAS:  
International Master in Atmospheric Sciences**

**BETWEEN**

**Université Clermont Auvergne (Clermont-Ferrand, France)**

**Johannes Gutenberg-Universität Mainz (Mainz, Germany)**

**Ilia State University (Tbilisi, Georgia)**

**University of Wyoming (Laramie, Wy USA)**

## Memorandum of understanding: Introduction

This Agreement sets forth the conditions by which the following four collaborating universities, (hereinafter collectively referred to as “collaborating universities” or “parties”):

- 1: Université Clermont Auvergne (Clermont-Ferrand, France)**
- 2: Johannes Gutenberg Universität Mainz (Mainz, Germany)**
- 3: Ilia State University (Tbilisi, Georgia)**
- 4: University of Wyoming (Laramie, Wy USA)**

agree to exchange and support students for a Dual (=double) Master of Science (MSc) degree (hereinafter referred to as “dual degree” or “dual program”) in Atmospheric Sciences.

This agreement will provide the administrative framework for the functioning of the program “International Master in Atmospheric Sciences” (InMas). This “International Master in Atmospheric Sciences” (InMas) program consists of the sum of two (elsewhere also called dual or double) locally accredited master’s degrees in international higher education of any two of the above collaborating universities. This agreement does not hold any commitment of financial support from any of the collaborating universities. It will, also, provide the basis for an eventual future proposal in the framework of an Erasmus exchange program, e.g., or for any other local, national or international funding opportunities. It will be maintained independent of the outcome of such proposals, relying in this case entirely on auto-financed participation. It is planned that this dual Master degree evolves in the future into an independent joint Master degree, with a national accreditation in each collaborating university’s country.

It is understood that a dual degree program will result in the awarding of any of two degrees listed below:

University Clermont-Auvergne (Clermont-Ferrand, France):

Master « Sciences de la Terre et des planètes, environnement (STPE) », parcours : Sciences de l’Atmosphère et du Climat (ScAC)

Johannes Gutenberg-Universität (Mainz, Germany)

Master of Science (M.Sc.) in Meteorology

Ilia State University (Tbilisi, Georgia):

Master of Physics ( will evolve soon into « Master of Atmospheric Sciences" for InMAS)

University of Wyoming (Laramie, Wy USA)

Master of Science (M.Sc.) in Atmospheric Science

These degrees will be accompanied by a supplement specifying the context of the “International Master in Atmospheric Sciences” program. These degrees will be awarded by each of the two institutions that enroll a participating student, for the number of credits

typically required for a master's degree at that institution. In the European Union, this corresponds to 120 ECTS (European Credit Transfer and Accumulation System) (see section II.2 for equivalence with US and Georgian credits) whereby 50% of the credits will be obtained in each collaborating university.

This dual InMAS degree program is established to enhance collaboration between the collaborating universities, to contribute to the development of our higher education institutions, to contribute to individual student's personal development and improve his/her chances in an international professional environment, and to contribute to the attractiveness of the European Higher Education Areas, to the European university excellence, innovation and competitiveness as well as transatlantic exchanges between the European Union and the United States.

This formalized agreement will facilitate the exchange of Master students due to the compatible teaching programs, the support provided by the INMAS Master's committee, the local support structures and the agreed double diploma with supplement descriptions beyond the usual individual student mobility. Further details about the scientific motivation of the program can be found in annex 1.

A dedicated InMAS web page for the students will facilitate the application and selection of home and host universities as well as the study program. It will provide detailed information of the InMAS program and contact information, as well as constantly updated course programs.

The dual Master of Science degree would be a double degree awarded by two of the collaborating universities. In the following "home institution" is the university where the student is first enrolled, and "host institutions" are the universities that receive the student at a later stage.

### **I. InMAS Master's Committee**

A joint admission and administration committee for the acceptance to the Dual Master Program (below also called InMAS committee or jaa committee) is established. Each university nominates into the committee the representatives it deems necessary to the proper functioning of the committee, while decisions will only be made by common agreement between the partner universities affected by the decision. The committee includes the scientific and pedagogic local coordinators of the program (see annex 1) and other administrative personnel of the involved universities, while the University Clermont Auvergne will serve as the overall coordinator, to consider student admissions, course choices, timetables, planning, and to assess the quality and objectives of the program, once it is in place. The committee will meet in person or by videoconference at regular intervals, and at least once per academic year.

### **II. Dual Degree Criteria**

The basic design for the InMAS dual degree program is given below in Table 1. The table serves as an example and will be completed and updated on the dedicated web page. From these



courses, the InMAS student, advised by the jaaa committee, will compile his/her study program, as detailed in section III below.

**Table 1.** This table presents the generalized outline of the InMAS dual degree with the available course structure for each semester and each university, as valid in 2017/2018. While the independence and diversity of each university's program is maintained to maximize the cultural and linguistic experience for students, it is also planned to provide a seamless set of options for each student that are flexible and adaptable to individual requirements. Students will need to complete at least 60 ECTS or 18 US credits (cr) at the "home" university and 60 ECTS or 18 US credits (cr) at one "host" university. These two universities will then award a MSc degree if all other requirements are met, which together form the InMas degree in atmospheric sciences. M1 refers to the first year of the Master course, M2 refers to the second year; S1 denotes the first semester (generally fall semester) and S2 is the second (spring) semester

Collaborating universities	M1, S1	M1,S2	M2,S1	M2,S2
University Clermont Auvergne (Clermont-Ferrand, France)	Functioning of the climate system (3ECTS) Dynamics of the atmosphere (3ECTS) Atmospheric chemistry (3ECTS) Radiation and radiative transfer (3ECTS) Remote sensing and imaging (6ECTS) Statistical analysis and informatics (6ECTS) Geophysics tools (3ECTS) Scientific English (3ECTS)	Thermodynamics of the atmosphere (3ECTS) Boundary layer and turbulence (3ECTS) Air quality (3ECTS) Analytical techniques (6ECTS) Numerical modelling (3ECTS) Scientific methodology (3ECTS) Individual project (9ECTS)	Sampling and analyzing the atmosphere at the summit of the Puy de Dome mountain (3ECTS) Cloud and precipitation physics (3ECTS) Modern in-situ and remote sensing methods (3ECTS) Numerical modeling applied to the atmosphere (3ECTS) Signal processing (3ECTS), estimation of climate risks (3ECTS) Hydrologie (3ECTS) Management and communication (3ECTS) Seminars (3ECTS) Scientific English (3ECT)	Internship with Master thesis (30ECTS)
Johannes Gutenberg-Universität (Mainz, Germany)	Modeling (7 ECTS) Large-scale Atmospheric Dynamics	Application of Models (7 ECTS) Theory of Radiation	Preparatory Module for the Master Thesis (10 ECTS)	Master Thesis (30ECTS)

	(11 ECTS)  Current Topics of Atmospheric Research (6 ECTS)  Free Election Subject (6 ECTS)	(6 ECTS)  Trace Gas Dynamics (3 ECTS)  Advanced Practical Training in Meteorology 2 (6 ECTS)  Free Election Subject (8 ECTS)	Meteorological Seminar (3 ECTS)  Applied Radiation (3 ECTS)  Atmospheric Chemistry (7 ECTS)  Optional courses for free selection (7 ECTS)	
Ilia State University (Tbilisi, Georgia)  (NB: mandatory 30 credits each semester; the rest of credits students are free to choose from other courses)	Atmospheric Physics (6ECTS) Hydrodynamics and Magnetohydrodynamics (6ECTS) Mathematical Methods in Physics (6ECTS) Astrophysics (6ECTS) Mathematical modelling (6ECTS)	Ionospheric Physics (6ECTS) Solar-Terrestrial coupling Physics (6ECTS) Satellite Data Processing (6ECTS) Solar Phycs (6ECTS)  1 Optional course for free selection (6 ECTS)	Remote Sensing Instruments and Methods (6ECTS) Physics of Cosmic Rays (6ECTS) Airglow Physics (6ECTS)  2 Optional courses for free selection (6 ECTS each)	Master Thesis (30ECTS)
University of Wyoming (Laramie, Wy USA) (*)	Physical Meteorology I (4cr) Dynamic Meteorology I (4cr)  Optional courses for free selection (graduate electives; not offered annually)  Total: 9cr	Physical Meteorology II (4cr) Synoptic & Meso Meteorology I (4cr)  Optional courses for free selection (graduate electives; not offered annually) Total: 9cr	Climate Science (3cr) Cloud and Precip Systems (3cr)  Optional courses for free selection (graduate electives; not offered annually) Total: 9cr <sup>1</sup>	MS Thesis (6cr)  Optional courses for free selection (graduate electives; not offered annually)  Total: 9cr

(\*) Comments on the University of Wyoming curriculum:

- 4cr courses have 3 hours of lecture time, and 3 hours of lab. 3cr courses have just 3 hours of lecture, per week
- University of Wyoming *graduate electives* are offered only upon demand (min ~5 students, both InMAS and local graduate students). It remains a tradition that at least 3 elective courses (9 cr) are offered in any one semester. The options include: Radar Meteorology (3cr), Boundary-layer Meteorology (3cr), Atmospheric Chemistry (3cr), Meteorological Instrumentation (3cr), Advanced Cloud Microphysics (3cr), Mesoscale Meteorology (2cr), and Atmospheric Radiation (3cr).

- The student may opt to do the MS thesis (6 credits) as early as the summer semester between Academic Years 1 and 2. The summer semester runs from early June to early August.

### **II.1 Requirements of the Programs:**

The InMAS program stipulates that a participating student must accomplish 60 ECTS (or 18 US cr) at each of the home and host university, not excluding another shorter period at a third university. This will provide the student with exposure to at least one other major language and culture and a possible complementary experience at a third site, while eventual credits obtained at the third site are not taken into account for the required 120 ECTS of the InMAS program.

### **II.2 Equivalence:**

#### **Academic year equivalence**

-It is agreed that one academic year corresponds to 60 ECTS, or 18 US cr.

-It is agreed that the master course teaching content of one academic year of the collaborating universities are equivalent.

#### **Semester equivalence**

-It is agreed that one semester at one collaborating university (30 ECTS or 9 US cr) is considered equivalent to one semester at another collaborating university.

#### **ECTS vs US credit equivalence**

“ECTS” is the European Credit Transfer and Accumulation System and a standard for comparing the study attainment and performance of students of higher education across the European Union and other collaborating European countries. One ECTS year has 60 ECTS and a semester 30 ECTS.

There is no absolute equivalence between ECTS and US credit hours, as they are calculated with different criteria.

University of Wyoming and the European universities have different credit requirements for an academic year. Full time for international students at University of Wyoming is considered to be 9 US credits per semester, and at the European Universities full time is considered to be 30 ECTS credits per semester.

For the exchange between University of Wyoming and the EU the credit equivalence will be set at 3.333 ECTS per US credit hour (cr).



At all collaborating universities these credits will involve a mixture of formal coursework and independent research. In spite of the differences in equivalency used between the University of Wyoming and the European universities, it is anticipated that the workload on the students will be comparable. It is agreed (above) that the academic year and semester contents of all institutions are equivalent.

#### **ECTS vs Georgian credit equivalence**

Credits obtained at Ilia State University have the same value as ECTS.

#### **Grade equivalence**

Whenever a grade conversion becomes necessary, each university will apply its own grade equivalence conversion procedures.

#### **II.3 Mandatory exchange times**

Full-time exchanges of two semesters (= 1 academic year) by students from one university to another university will be taken as the equivalent of two full-time semesters, or 60 ECTS, or 18 cr.

Additional credits can be acquired at a third university. However, a minimum of 60 ECTS, or 18 cr equivalent at the "home" and one "host" university are required to be awarded a dual master degree.

### **III. Acceptance of Students to the InMAS Dual Degree Program**

The coordinator at the home university (see annex 1 for current names; updated on the web page) will be the contact person of InMAS for the students and will advise and help with their application.

The InMAS consortium will set up a joint admission and administration (jaaa) committee composed of the local scientific and pedagogic coordinators potentially complemented by administrative personnel as deemed necessary by each university (compare section I). The committee will be in charge of the evaluation of the InMAS admission applications and will take the decision by common agreement between the partner universities affected by the decision only.

The admission requirements of the InMAS programme will at least meet the minimum admission requirement of each collaborating university and are detailed in section IV.5 and 6.

The prospective student will enroll at the home university. Once accepted in the Master program at the home university, the student will apply for the InMAS program and propose a study plan to the InMAS jaaa committee, indicating motivation, previous educational records, collaborating universities to be attended and courses to be taken. Taking into account that the Universities are autonomous in their own Master program, the student's plan can combine M1

and M2 ECTS courses of one collaborating university, in order to avoid redundancies in the courses.

The application will be examined by the jaaa committee and ranked with respect to all applications taking into account merit records, selected host universities, motivation and feasibility of the study plan. Once accepted by the committee, the application will be examined by the host universities. Then, the student will be eligible to apply for registration at the home and host university under the terms of this dual program.

Students intending to participate in the dual degree program must apply to and be enrolled by the host university. It will be the responsibility of each student participant in the dual degree program to obtain pre-approval from his/her home university and the jaaa committee to seek admission by the host university for the approved study program.

Students may modify courses on the plan after it is accepted, only with approval of the jaaa committee, e.g. to accommodate changes in the optional courses whose openings depend on attendance.

### **III.1 Master's Thesis:**

The Master thesis is a strict prerequisite for being awarded a Master of Science degree from each party to this agreement. However, joint supervision of the thesis work by the faculty advisors is not mandatory. The thesis will be defended at one or both awarding universities in-situ or by the means of a video-conference, depending on the local requirements.

### **III.2 Graduation and Diploma:**

The students participating in this program have to satisfy the degree requirements of both home and host universities in order to graduate with the dual degree. At the completion of the dual degree program as set forth in this Agreement, both universities will confer the degrees and issue diplomas for students. Additionally, the InMAS committee will provide a Diploma Supplement for the International Master in Atmospheric Sciences program including and detailing also any additional credits acquired at other third host universities.

### **III.3 Graduation with Extenuating Circumstances:**

In the event that students encounter circumstances that make it impossible for them to complete the requirements of the dual degree, it is the home university's option to allow its respective student to complete the requirements of a non-dual local degree, conferring its own degree and awarding of its own diploma. The home university can provide a supplement to this diploma detailing the foreign credits that were acquired.

## **IV. Student Mobility**

It is agreed that:



#### IV.1 Home and Host Universities

The purpose of student mobility will be to enable students to take classes at, and to pursue a dual degree from, both the home and host universities.

Within the framework of this exchange, "home university" will mean the university in which a student is first enrolled as a degree candidate, and "host university" will mean the university that has agreed to receive students from the home university for a period of study for the International Master in Atmospheric Sciences program.

#### IV.2 Taking Courses at the Host University

Courses passed at the host university will be accepted for credit towards the degree at the student's home university if pre-approved by the InMAS jaaa committee. It will be the responsibility of each student participant in the dual degree program to obtain this pre-approval by the jaaa committee for courses taken to ensure proper credit transfer recognition. The jaaa committee will insure that all requirements from home and host universities are met. The approved courses are set out by the jaaa committee in the InMAS student's course plan.

#### IV.3 Recognition of credits

If because of any equivalence a student falls short of the number of credits required to complete a semester, or year, or the Masters by a fraction of a US credit, this may be rounded up, in recognition that there is no exact equivalence between all courses.

#### IV.4 Academic Year

"Academic year" in the context of this agreement is defined as fall and spring semester/term for the US University and may optionally include the summer session that follows the spring term. Fall semester is equivalent to the Semester 1 at EU universities and Semester 2 is the spring semester, which may optionally include the summer session that follows the spring semester. The table below gives the ideas of the current dates. It will be updated on the web page.

Collaborating universities	Beginning and end of teaching S1	Beginning and end of teaching S2
University Clermont Auvergne (Clermont-Ferrand, France)	1 Sept – 15 Jan	15 Jan – 15 July
Johannes Gutenberg-Universität (Mainz, Germany)	Semester: 1 Oct – 31 Mar Teaching Period: Oct - Feb	Semester: 1 Apr – 30 Sept Teaching Period: Apr - July
Ilia State University (Tbilisi, Georgia)	October - January Exams - February	March - June Exams - July
University of Wyoming (Laramie, Wy USA)	2017: 30 Aug - 11 Dec 2018: 29 Aug – 10 Dec	2018: 22 Jan – 4 May 2019: 28 Jan – 10 May

	2019: 4 Sept – 13 Dec	2020: 27 Jan – 8 May
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For the InMAS dual-degree program the academic year is thus approximately 9 months long, but can be extended to include the summer to become 12 months. While the time period can be variable, the requirement is to accomplish 60 ECTS (or 18 US cr) in one academic year.

#### **IV.5 Admission Requirements**

Each home university will nominate students for the dual-degree InMAS program and will forward relevant data concerning those students to the host university, respecting eventual confidentiality constraints.

Students will be admitted to the InMas program during two main selection periods, one in May for a start in the S1 and one in November for a start in the S2 period. Exceptionally, applications outside these periods can also be considered.

All applications shall be composed of the appropriate application forms, a letter of motivation, the candidate's official academic transcripts, a proof of sufficient language proficiency, and information on the type of program that is desired by the nominee (period, host university, modules). The detailed information regarding application will be available on the web page. The jaaa InMAS committee will screen and approve applications for admission to the program, as a function of the number of available places and the academic merits of the candidate, taking also into account language proficiency, motivation, selected host university and the study program. Each home university shall respect the sovereignty in admission requirements and enrollment constraints of the host university. Program participants will be subject to the standard rules, regulations, and enrollment constraints (see e.g. language requirement below) of the host university in the admission and selection of courses. The host university shall have final authority on the administrative admission decisions. It is expected that the host university will accept qualified nominations proposed by the InMAS jaaa committee except in extraordinary circumstances. The InMAS program strives for a balance of outgoing and incoming students. The InMAS jaaa committee will assess this balance and take efforts to further an overall balance (see IV.9 for precisions).

#### **IV.6 Language Proficiency and language services**

The language of instruction for the dual degree is English. The local culture and languages are considered an important part of the exchange experience and their acquisition is encouraged through additional proposed language courses as seems appropriate by each university. Only university students with an acceptable level of English (according to the rules of the host university) will be chosen for the exchange. The required proficiency of the English language corresponds to the B2 level of the European language requirement framework and needs to be documented for all non-english/non-american natives.



The host universities will provide any necessary language training for the incoming exchange students, in the form of optional summer schools or continual courses throughout the academic year. Some of the optional courses are packages including a fee for accommodation and tuition.

All parties recognize that the best language training occurs when students are integrated into the host university's student academic and social activities.

#### **IV.7 Cultural interchange**

The host parties agree to provide a deep exposure to the culture of their respective state, nation or region.

Each incoming student will be allotted a tutor who will help with integration.

#### **IV.8 Full-time Enrollment Status**

Beginning with the academic year 2017/2018 and continuing for the four-year duration of this Agreement unless otherwise terminated as outlined herein, the parties will exchange students that are enrolled full time. The measure of exchange will be that one student-term/semester at a participating university equals one student-term/semester at the other participating university.

#### **IV.9 Balance**

Ideally around 3 students each way, per academic year, will be exchanged. The maximum number of students for exchange may be amended by mutual agreement. Every effort will be made to maintain an evenly balanced exchange from year to year. It is recognized, however, that circumstances may preclude an even exchange of students in a particular year or for particular collaborating universities.

#### **IV.10 Academic Advising**

The departments/divisions participating in the dual degree program at the home university are associated to the decision process of the jaaa committee and will provide academic counseling to ensure that the academic courses taken at the host university are acceptable to the home university. The host university will provide detailed course descriptions and syllabi to aid in course equivalency evaluation.

#### **IV.11 Academic and Social Performance**

Participants in the dual degree program will be governed by the same regulations and performance standards that pertain to other students at the home and host university. In



addition, the host university reserves the right to require the withdrawal of any dual degree program participant whose academic standing or conduct warrants such action under the Host's standard conduct and performance requirements. The host university will consult with the home university before finalizing such action.

If the participating student voluntarily withdraws or is dismissed for disciplinary reasons before the end of the term/semester, that student's participation in the dual degree program will have ended.

#### **IV.12 Access to Academic and Social Facilities**

Students shall be entitled or required, depending on the university where they are enrolled, to participate in any introductory or orientation courses or programs that may customarily be required for students at the host university and shall have the same rights of access to academic and social facilities provided by the host university as do regular students at the host university. Students participating in the dual program shall be subject to all of the rules, regulations, and disciplinary procedures of the host university while they are enrolled at the host university. The collaborating universities agree to cooperate fully in any investigation regarding an alleged violation of rules, regulations or laws, if local law so allows.

#### **IV.13 Transcripts**

Due to privacy laws, students must transmit a copy of their transcript from the host university to the home university at the conclusion of each term/semester, generally within one, but preferably not later than six weeks after their delivery. This request will be done in accordance with standard university policies and procedures.

#### **IV.14 Financial Aid**

In the case that financial aid becomes available, it will be processed (awarded, dispersed, reported, and records kept) and satisfactory academic progress will be monitored by the home university. To facilitate the awarding of financial aid, the designated office at the host university will convey to the home university details about cost of education at the host university, including tuition, fees, room and board, books, etc., as well as the applicable refund and repayment policies of the host university.

If refund and/or repayment involving financial aid funds become necessary, the home university will calculate the refund and repayment amounts.

No guarantee of financial aid is inherent in this agreement. Interested students should contact faculty members directly.

#### **IV.15 Specific grants**

The Parties will jointly or individually try to seek funding from national or international bodies and organizations to finance the scheduled activities.

#### **IV.16 Visa Support Services**

The host university will, within its means, assist its guest students, in obtaining visas and other documents required by the government of the host country. In order to comply with US government regulations, participants who are not US citizens will be required to provide a guarantee that they have the financial resources to meet all expenses. Upon submission of a satisfactorily completed financial form, the University of Wyoming's designated office will provide the student with a I20 form to apply for a F-1 Student Visa. The EU universities will provide an adequate acceptance letter and necessary information on how to apply for a Visa from the appropriate authorities.

### **V. Student Responsibilities and Expenses**

#### **V.1 Registration and Payment of Tuition**

Participating students will enroll at the host university and be registered or enrolled at their home university for each semester of exchange, according to local regulations.

The collaborating universities to this Agreement will require participating students to pay tuition and any required fees to their home university, if applicable. Participants will be exempted from paying tuition to the host university. Additional fees, e.g. for language courses might, however, be charged. It is at the discretion of every university to waive the exemption of tuition for all or part of the incoming students, if they so deem necessary or if local law so prescribes.

Over the project period a balance of exchanges is planned to be achieved (see IV.9).

#### **V.2 Payment of other Educational and Living Expenses**

The collaborating universities will not be responsible for the costs of books, fees, equipment, room, board, travel, transportation or other personal expenses. Host university fees (e.g. language courses) for which the student is responsible, if any, vary by university. The host university will inform students, at the time of their acceptance, of the approximate costs they will be responsible for at the host university.

#### **V.3 Housing**

Each university will assist participating students in securing housing for the period of time that they will be on the host campus; however, the cost of room and board will be paid by the student.

#### V.4 Health Insurance and Medical Expenses

Student participants will be personally responsible for purchasing the host university's and/or host country's required health/medical insurance for the time period of their exchange. The host university will assist incoming student participants in understanding and complying with the insurance requirements or identifying available insurance options.

If local legislation permits: The participating student shall provide emergency contact information. In the event that a participant is involved in a serious accident or other circumstance of grave nature, or is subject to disciplinary action, the host university should immediately notify the home university. If necessary, the immediate notification may be limited to a statement of the problem and a brief outline of intended plan of action. Detailed information should be forwarded to the home university in a timely manner.

Example of tuition and insurance costs for the parties (the numbers are given as an order of magnitude and are likely to evolve with time; updated information will be given on the web page):

Collaborating universities	Mandatory costs for enrolment (as of 24 March 2016):
University Clermont Auvergne (Clermont-Ferrand, France) (public university, subsidized by the state)	tuition: 256 € medical supplement: 5,10 € Culture : 10 € Sport : 30 € social security: 215 € <b>Total: 516.10 €</b>
Johannes Gutenberg-Universität (Mainz, Germany)	At JGU, there are no tuition fees. But all students - including exchange and ERASMUS students - have to pay the semester fee ("Semesterbeitrag"): <b>296.04 Euro (total)</b> <ul style="list-style-type: none"> <li>• 200.34 EUR: Semesterticket (The semester ticket ("Semesterticket") entitles you to ride all busses, streetcars and local trains (S-Bahn or Nahverkehrszug) in Mainz and Wiesbaden as well as the in the larger Rhein-Main area.</li> <li>• 93.70 EUR: Service institutions and benefits at JGU (e.g. student union canteen, sport facilities)</li> </ul> <p>The semester fee is a mandatory student services charge. The fee payment is a necessary prerequisite for enrolment.</p>
Ilia State University (Tbilisi, Georgia)	Tuition fees: for Georgian students 2250 GEL per year (about 900 US\$, depending on the exchange rate); for international students 6500 US\$ per year. (1 euro – 2.74 GEL conversion rate from July 2017)
University of Wyoming (Laramie, WY)	Students with a graduate assistantship are considered in-state (WY)



USA)	<p>students, and their tuition is about US\$250/cr, so for a full year this is \$4500 (9 cr/semester). Students without a graduate assistantship AND resident out-of-state (non-Wyoming) pay 3 times as much per credit. In addition, students pay fees, about \$1100 per year.</p> <p><b>Total: US\$5600 (in-state) or \$14600 (out of state)</b></p> <p>Health insurance for students with a graduate assistantship is provided by UW. Students without a graduate assistantship are expected to cover their own health insurance; the current cost is \$2,044 per year.</p> <p>(1 euro – 1.139 US\$ conversion rate from july 2017)</p>
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## VI General Provisions

### VI.1 Program Liaison

The academic units of the collaborating universities under the terms of this agreement shall each identify a Program Liaison who shall be responsible for all matters relevant to this dual degree program agreement. The current names are given in the annex, but can evolve with time.

### VI.2 Legal Indemnities and Policies

VI.2.1 Ownership of inventions, discoveries, and works of authorship which are discovered, conceived, and/or created directly pursuant to any activity under this Agreement (Intellectual Property) shall be with the university(s) where such Intellectual Property was discovered, conceived, and/or created.

All collaborating universities agree to acknowledge any participation of the other in any publications resulting from activity under this Agreement and, subject to any conflicting rights of third parties, agree that both parties may use the results obtained from the activities conducted under this agreement for internal education and research purposes.

VI.2.2 No monetary consideration will be exchanged between the collaborating universities, nor will there be any indemnities, reimbursements for expenses, or sharing of fees or profits arising from the dual degree program.

VI.2.3 The relationship of the collaborating universities under the terms of this agreement shall be that of contracting parties solely as provided herein and a party shall not be deemed, nor hold itself out as being, a partner or agent of another collaborating university. None of the collaborating universities will be liable for the acts of another collaborating university, nor shall any of the collaborating universities be liable for the acts of students participating in the dual program.

VI.2.4 All collaborating universities of this Agreement subscribe to a policy of equal opportunity and will not discriminate on the basis of race, gender, age, marital status, ethnicity, religion, national origin, sexual orientation, or disability, or any other basis prohibited by the laws of that university's home country.

VI.2.5 The obligations of the collaborating universities under the terms of this agreement are limited to the collaborating universities under the terms of this agreement and shall not extend to nor be enforceable by any third party. The rights and obligations of any dual program students with respect to the collaborating universities under the terms of this agreement will be only those rights that accrue as a result of their acceptance and admission as a student by the respective university. No such rights shall extend to any spouse, partner or dependent.

VI.2.6 Specific details not included in this dual program agreement will be developed jointly and spelled out in a separate addendum to the present Agreement and approved in writing and signed by the appropriate university officials.

The association of additional universities to the consortium can be formalized in such a separate addendum.

VI.2.7 The University of Wyoming does not waive its sovereign immunity or its governmental immunity by entering into this Agreement and fully retains all immunities and defenses provided by law with regard to any action based on this Agreement. Any actions or claims against the University of Wyoming under this Agreement must be in accordance with and are controlled by the Wyoming Governmental Claims Act, W.S. 1-39-101 et seq. (1977) as amended.

### **VI.3 Review, Contacts, Signatories**

This Agreement shall be effective until August 31, 2021. It shall be subject to revision or modification by mutual written agreement. Any party may terminate its participation in the Agreement by written notice submitted at least 90 days in advance of the next academic semester (90 days prior to 1 Sept and 15 Jan). Termination would not affect students already engaged in the Agreement and will not impact the remaining parties to the Agreement. Renewal will be covered by signing a new exchange agreement between collaborating universities.

If the Agreement is not renewed by mutual consent, the Agreement will conclude at the end of the specified time period, or after activities in progress have concluded.

Every litigation related to the misunderstanding of one part of this agreement and which could not be amicably discussed between the parties or any other claims or actions in connection with the Agreement which could not be amicably discussed between the parties should be solved by recourse to the competent judicial instance and laws designated by the defendant party.

### **VI.4 Limitation of Resources Committed**

The agreement does not create an obligation for any party to provide resources necessary to carry out any part of the agreement except to the extent that the respective collaborating universities administrations provide these resources on an annual basis in their regular teaching program.

**VI.5 Additional Implementing Agreements**

The parties may explore the possibility of the creation of additional joint programs or other collaborations between various units of the collaborating universities. Such additions will be covered by developing new agreements between collaborators in writing signed by the applicable collaborating universities.

This agreement is written in four original copies, one for each collaborating university. Further copies can be added upon request.

Institutions involved	Official representatives signatures	Date
Université Clermont Auvergne	Mathias BERNARD Président  	05 OCT. 2017
Johannes Gutenberg-Universität Mainz	Univ.Prof. Dr. Georg Krausch Präsident 	4.9.2017
Ilia State University	Dr. Giga Zedania Rector 	14.09.2017
University of Wyoming	Laurie Nichols President 	9-26-2017



## Annex 1: Scientific description of the Consortium and the interest of an International Master in Atmospheric Sciences

### 1.) List of collaborating universities and scientific and pedagogic coordinators:

1: University Clermont Auvergne (Clermont-Ferrand, France)  
"Laboratoire de Météorologie Physique" LaMP (piloting institution)  
(resp : Andrea Flossmann, [A.Flossmann@opgc.univ-bpclermont.fr](mailto:A.Flossmann@opgc.univ-bpclermont.fr))  
<http://www.obs.univ-bpclermont.fr/atmos/fr/index.php>

2: Johannes Gutenberg-Universität Mainz (Mainz, Germany)  
"Institut für Physik der Atmosphäre" IPA  
(resp: Stephan Borrmann ; [stephan.borrmann@mpic.de](mailto:stephan.borrmann@mpic.de))  
<https://www.blogs.uni-mainz.de/fb08-ipa/>

3: Ilia State University (Tbilisi, Georgia)  
Abastumani Astrophysical Observatory  
Laboratory for Atmospheric and Space Physics  
Prof. Goderdzi Didebulidze  
(resp: Maya Todua; [mayatodua@iliauni.edu.ge](mailto:mayatodua@iliauni.edu.ge))  
<http://iliauni.edu.ge/en/iliauni/institutebi-451/evgeni-xaradzis-abastumnis-astrofizikuri-observatoria-461>

4: University of Wyoming (Laramie, WY USA)  
Department of Atmospheric Science  
(resp: Bart Geerts; [geerts@uwyo.edu](mailto:geerts@uwyo.edu))  
<http://www.atmos.uwyo.edu/>



## **2.) Motivation:**

Atmospheric Sciences is a discipline that occupies a key role in understanding the evolution of a changing Earth. The 5<sup>th</sup> IPCC report has confirmed that climate is changing, however the regional assessment in this global change is much more difficult to quantify, due to the large uncertainties in small-scale processes such as clouds or turbulence. The transnational influence of climate change e.g. on the regional water budget and the pollution level of urban and extra-urban regions and the feedback of those processes back on climate are still under debate. Top-level research on these subjects is ongoing and needs to be continued to provide the missing information for climate researches, but also stakeholders and local decision makers. Another aspect is the improvement of regional and local weather forecast. Many of the underlying physico-chemical and meteorological processes are by far not well enough understood or are not represented with sufficient detail and accuracy (e.g. for precipitation) in the operational models for numerical weather prediction. Here also top-level research continues to be necessary and of high economic and societal relevance. A third aspect concerns the more applied facets of atmospheric surveillance and consulting in national or transnational institutions that are in dire need of both a global vision of and competences in climate and air pollution management.

The competences needed to address these small and regional scale processes are currently taught in Bachelor and Master Courses, associated with research laboratories with excellent competences in some of these domains. The basics of atmospheric sciences are generally taught in the same manner all over the world. However, due to the variety of the fields necessary for the understanding of meteorology, atmospheric pollution and climate, no single laboratory is at the research “cutting edge” in all concerned thematic fields. For students interested in Atmospheric Sciences this means that they will generally need an additional excellent training in the speciality of the local competences, irrespective of his/hers personal interests.

Due to the diversity of the subjects and the very limited number of Master courses in atmospheric sciences in each country, in most cases, not even neighbouring national master can satisfactorily cover all subjects. Furthermore, the “state of the art” equipment necessary is increasingly expensive, limiting its deployment to few centres of excellence. Consequently, Atmospheric Sciences is one of the leading domains in international collaboration, and for a successful career as a future scientist or an environmental manager, an exposure to this transnational culture ought to occur at the earliest moment in education.

## **3.) Objectives:**

The objective for proposing this International Master in Atmospheric Sciences is to link together the complementary excellence of research institutes in atmospheric sciences to enable the student to specialize in a research subject that both exceeds the competences of his/her home university and encompass his/her personal field of professional interest. It is designed in particular for excellent students that aim for a future research, teaching or professional career in atmospheric sciences or any other related domains.



Whereas the climate studying community is generally working on the same topics, e.g. due to the IPCC and CMIP initiative, the research on smaller scale processes determining climate change, meteorology and air quality is more diverse. Due to the elevated costs of “most advanced equipment” equipment and the associated mandatory competence, only few laboratories work on neighbouring much less overlapping subjects. In particular, the research concerning cloud and air pollution related processes is conducted in only few laboratories all over the globe, even though fundamental to improve all understanding and forecast.

The idea of this Master is to bring together a training competence regarding in particular the understanding of cloud and atmospheric pollution processes through in-situ or remote sensing observations and modelling. The consortium is composed of 4 universities which each hosts a laboratory of atmospheric sciences that is internationally recognized for the excellence of their research in complementary fields. Together, they can provide for the students training on the latest instrumentation, concepts and competences as well as pollution and climate regulations and directives to enable them a future carrier in the field of atmospheric sciences.

**Collaborating university 1** (LaMP) is specialized in in-situ cloud and chemistry observations, as well as process oriented and meso-scale modelling.

**Collaborating university 2** (IPA) is specialized in atmospheric chemistry, trace gas dynamics, cloud-physics (laboratory and field research), numerical simulation of cloud processes and dynamic meteorology; in-situ experimental research from aircraft also at high altitudes.

**Collaborating university 3** (ILIAUNI) extends the competence in searching for climate change signals in long-term variations in upper atmosphere-ionosphere and remote sensing measurements

**Collaborating university 4** (University of Wyoming, UW) has a long record of expertise in airborne atmospheric observations, using in situ cloud, aerosol, and chemistry probes, radars and lidars. It continues to specialize in the study of aerosol-cloud-precipitation interactions and cloud-scale dynamics.

All atmospheric science research institutes of the collaborating universities are already collaborating in different European or international projects.

The “**human scale**” of the research laboratories, the corresponding universities and the motivation of their personal will assure an individualized support and mentoring of the student, in contrast to big research institutes in major cities, where the students might feel lost in the masses. In addition, the universities are located in medium sized cities all over Europe and the USA, which makes them attractive due to the moderate living expenses.

The objective beyond the education of students in a large variety of subjects by a number of excellent scientists is to increase their chances of success in a globalized world in a transnational discipline.



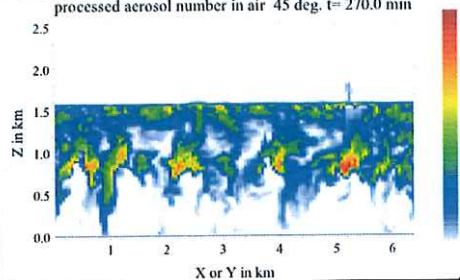
The diploma associated to InMAS will foster excellence, quality improvements, innovation, excellence and internationalisation in higher education institutions and improve the level of competences and skills of Master graduates, and in particular for the labour market.

#### **4.) Presentation of the research consortium**



**4.1 Laboratoire de Météorologie Physique: LaMP**

The LaMP is a research laboratory that is financed partly by the Clermont Auvergne University of Clermont-Ferrand (France) and partly by the French CNRS (French Scientific National Research Council). It regroups about 50 people, organised in 3 research groups around two research themes: “clouds” and “atmospheric aerosol particles”. These subjects are approached through ground-based (instrumented air quality and pollution measurement station on the summit of Puy de Dôme, radars, lidars, ..), airborne (the LaMP is responsible for the microphysical and chemical measurement platform on all French research aircrafts) and spaceborne observations, instrument development, as well as through meso-scale modelling of clouds, aerosol particles and atmospheric chemistry. The LaMP is part of the Observatoire de Physique du Globe de Clermont-Ferrand (OPGC) that include researchers and engineers who operate the Puy de Dôme monitoring station that contributes to national and international networks addressing atmospheric physics and chemistry.

		
<p>Measuring platform on the Puy de Dôme monitoring station</p>	<p>French ATR-42 with microphysics and chemistry measuring devices</p>	<p>Model result of the number of aerosol particles processed by marine stratocumulus clouds</p>

**4.2 “Institut für Physik der Atmosphäre” IPA**



The expertise of IPA at the University of Mainz in close collaboration with the Max Planck Institute for Chemistry (MPIC) in Mainz covers experimental and theoretical cloud physics, trace gas dynamics, dynamic meteorology, as well as Earth System Science.

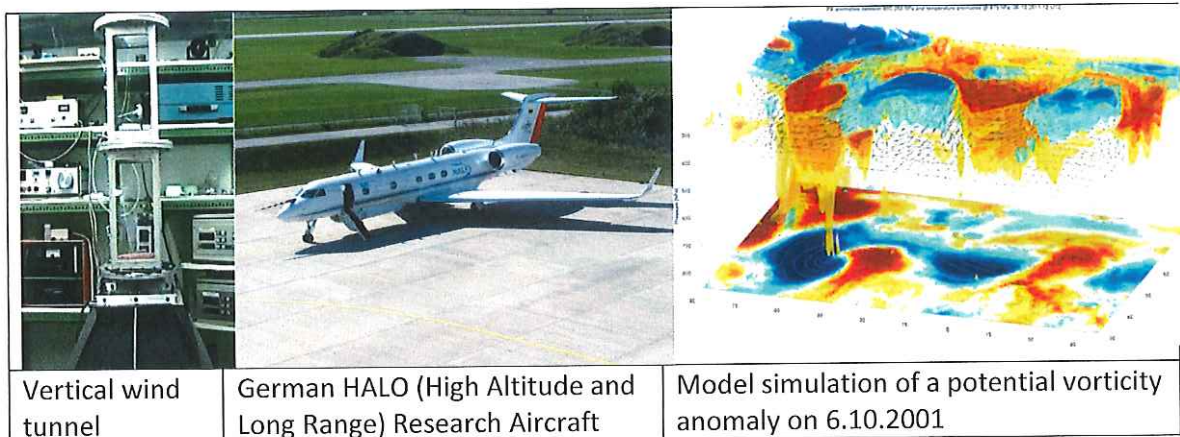
The experimental groups:

- \* operate a large vertical wind tunnel facility for studies on the physics and chemistry of precipitation sized hydrometeors,
- \* a suite of 15 instruments for in-situ measurements on research aircraft from the boundary layer up to a stratospheric altitude of 20 km. The instruments measure trace gases (e.g. CO, N<sub>2</sub>O), cloud and aerosol physical parameters, as well as the chemical composition of cloud and aerosol particles by mass spectrometry.
- \* a mobile laboratory (i.e. an instrumented van) for investigations on aerosols and gases in polluted environments.

The theory groups perform numerical simulation studies on

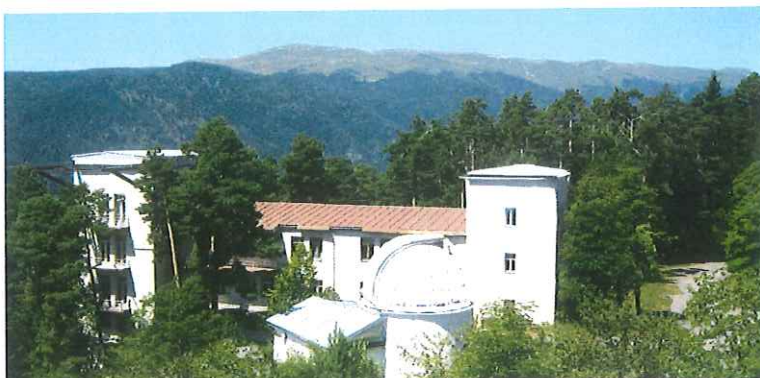
- \* Atmospheric dynamics: Rossby waves, tropical cyclones, micrometeorology, and the dynamics of the tropopause region
- \* Theoretical cloud physics: multiscale phenomena in clouds, the interaction between dynamics and microphysical processes of cirrus clouds, the formation of structures in ice clouds, aerosol cloud interaction
- \* Earth System Science: chemistry – climate Earth system modelling on multiple (up to global) scales, interactions of atmospheric chemistry and dynamics, clouds and convection and their interactions with aerosols and chemistry (using mainly the Modular Earth Submodel System (MESSy) in conjunction with the ECHAM5 climate and the COSMO weather forecast models).

The close collaboration with MPIC offers a unique opportunity for students to benefit from the research oriented study program as well as joint activities of IPA and MPIC.



#### 4.3 Abastumani Astrophysical Observatory at Ilia State University, Atmospheric Research Laboratory





The Laboratory is equipped with the following instruments: lidar M10 system for measurement of vertical distribution of tropospheric aerosols, ozonometer for measurement of total ozone content, all-sky imager for monitoring of dynamical processes in mesopause by OH emission, infrared spectrometer GRIPS-5 for measurement of mesopause temperature, scanning-mirror photometer for measurement of the upper atmosphere emission intensity, H $\alpha$  photometer, meteorological station, high-frequency GPS for measurements of total electron content.

The staff of the Laboratory has an expertise in lower and upper atmosphere investigation, including their coupling, search for climate change signals in long-term variations in various atmospheric parameters.

#### 4.4 University of Wyoming



The Department of Atmospheric Science at the University of Wyoming Research areas include clouds and precipitation, air pollution, mesoscale dynamics, airborne instrumentation, and boundary-layer processes. Most faculty members focus on measurements, except a small group that is expert on model parameterizations of aerosol and cloud processes.

The Department operates a research aircraft (pictured above), equipped with cloud radar, cloud lidar, and a variety of in situ probes to measure cloud microphysics, chemistry, fluxes, pressure perturbations, and basic meteorological variables. The Department also operates a mobile air quality lab. The Department has privileged access to the NCAR Wyoming Supercomputer.