Iván Mauricio Burbano Aldana

ivanmbur@gmail.com, Cr. 19 # 63 27, Bogotá, Colombia, (+57) 316 782 1110

About me

Born on December 26, 1996 in Bucaramanga, Colombia, I've always been characterized by my strong passions. My first discoveries on symmetry through music laid the basis for my passion to understand what surrounds us. Physics has offered me a path through which I can explore the world making use of my creativity. At this point in my life I've decided to take advantage of every chance I get along the way to learn new things, meet new people, and become a better person. I am certain that the success of this enterprise will be guaranteed by the discipline and commitment I give to my work.

Special Skills

Theoretical Physics: Geometric, algebraic, and topological methods in physics.

Mathematics: Algebra, Topology, Analysis, Measure Theory, and Algebraic Topology.

Programming: Unix/Linux, Java, Python, C, IRIS, and DS9.

Experimental Physics: Infrared sensors and electrochemically exfoliated graphene.

Languages: Spanish and English (*TOEFL* 113/120). Three semesters of german studies.

Education

Physics Masters
Universidad de los Andes, Bogotá, Colombia
In progress

Physics Major
Universidad de los Andes, Bogotá, Colombia
Cum Laude
Mathematics Minor
Thesis: KMS States and Tomita-Takesaki Theory
March 2018
Average: 4.72/5

Highschool degree: Academic Bachelor
San Carlos School, Bogotá, Colombia
June 2014

Awards

- *Cum Laude Undergraduate Degree* for graduating with grades amongst the top 3% of the past five years of the science faculty at the Universidad de los Andes.
- *Semiannual Excellence Prize* for the best grades on the first semester of 2017 of the Physics department at the Universidad de los Andes.
- *Ramón de Zubiría Prize* for the best global grades up to the first semester of 2016 of the Physics department at the Universidad de los Andes.
- *Semiannual Excellence Prize* for the best grades on the second semester of 2015 of the Physics department at the Universidad de los Andes.
- *Honorable mention* in the 45th International Physics Olympiad (Kazakhstan 2014).
- *Third place* in the Colombian Physics Olympiad of 2013.

Experience

SURF California Institute of Technology: I worked under the supervision of Dr. Roger Smith and Dr. Andrés Plazas during the summer of 2017. I aided the investigation, characterization, and correction of image centroid motions at the Precision Projector Laboratory in the Jet Propulsion Laboratory (NASA). The detectors investigated will be used for the study of weak gravitational lenses and dark matter in missions such as WFIRST and Euclid.

Teacher at the Universidad de los Andes:

- Physics 2 recitation in the second semester of 2018.
- Experimental Physics 1 in the second semester of 2018.
- Physics 1 recitation in the first semester of 2018.
- Basic Physics 1 recitation in the first semester of 2018.

Teaching assistant at the Universidad de los Andes:

- Lineal Algebra 2 with professor César Galindo in the second semester of 2016.
- Physics clinic in the second semester of 2016.
- Linear Algebra (Honors) with professor Sergio Adarve in the first semester of 2016.

Nanomaterials Laboratory: during the second semester of 2016 I researched the actuating properties of electrochemically exfoliated graphene under the supervision of professor Yenny Hernández as part of the Intermediate Lab course.

Tutor: I have helped students of Physics 1, Physics 2, Integral Calculus, Vector Calculus, Linear Algebra 2, and Mathematical Methods.

Seminars

Noncommutative Geometry and Poisson Geometry Around Groupoids School and Conference: Applications of Tomita-Takesaki Theory to Quantum Physics I.
Villa de Leyva, Colombia July 2018

Quantum Optics Seminar: Quantum Logic and the Orthocomplemented Lattice of Propositions: A logic based approach to Bell's inequalities.
Universidad de los Andes, Bogotá, Colombia
June 2018
`https://opticacuantica.uniandes.edu.co/index.php/es/eventos/historico-de-seminarios`

Topological Order and Beyond: KMS States and Tomita-Takesaki Theory.
Universidad de los Andes, Bogotá, Colombia
June 2018
`https://matematicas.uniandes.edu.co/~cursillo_gr/escuela2018/abstracts.php#abstract_burbano`

Quantum Field Theory and Mathematical Physics Seminar: Algebraic Formulation of Quantum Physics.
Universidad de los Andes, Bogotá, Colombia
February 2018

La Cicuta Magazine 7th edition release: On the Communication and Censorship of Science.
Universidad de los Andes, Bogotá, Colombia
September 2017

Quantum Field Theory and Mathematical Physics Seminar: Orthocomplemented Quantum Lattices of Propositions.
Universidad de los Andes, Bogotá, Colombia
April 2017

Seminars Attended

Journeys into Theoretical Physics
IFT-Perimeter-Saifr
São Paulo, Brasil
July 2018

Noncommutative Geometry and Poisson Geometry Around Groupoids School and Conference
Villa de Leyva, Colombia July 2018

Topological Order and Beyond
Universidad de los Andes, Bogotá, Colombia
June 2018

Dynamics of Quantum Systems Outside of Equilibrium
Universidad de los Andes, Bogotá, Colombia
December 2017

URDiplomats workshop
Universidad del Rosario, Bogotá, Colombia
April 2014

Extracurricular Activities

- Tutoring at the Iglesia de Nuestra Señora de las Aguas for the state exam. This was targeted at low income teenagers of La Candelaria neighborhood.
- Guitar classes targeted at low income teenagers. This was part of my social service at high school.
- Elected president of the student council at Colegio San Carlos during my senior year.
- I teamed up with the United Nations Information Center to design the first UN model at a citywide scale SIMONU 2013. I also acted as the Secretary General of the UN model of my school SACMUN X and performed as president and delegate of various other models in Bogotá.

References

- Prof. Andrés Fernando Reyes Lega: anreyes@uniandes.edu.co
- Dr. Roger Smith: rsmith@astro.caltech.edu
- Dr. Andrés Plazas: andres.a.plazas.malagon@jpl.nasa.gov
- Prof. Carlos Andrés Flórez Bustos: ca.florez@uniandes.edu.co
- Prof. Sergio Adarve: sadarve@uniandes.edu.co
- Prof. César Neyit Galindo Martínez: cn.galindo1116@uniandes.edu.co

Universidad de los Andes

CERTIFICADO DE NOTAS

Noviembre 26 de 2018

NOMBRE: BURBANO ALDANA IVAN MAURICIO **CODIGO:** 201423205

NIVEL: PREGRADO **DOC. IDENT:** CC-1019126827

PROGRAMA: FÍSICA **FACULTAD:** CIENCIAS

TITULOS OBTENIDOS: **FECHA GRADO:**

- FÍSICO 23/03/2018

201420 SEGUNDO SEMESTRE 2014
Programa: FISICA

Código	Nombre de la Materia	Cred	Nota
FISI 1002	INTRODUCCION A LA FISICA	1	A
FISI 1018	FISICA I	3	5.00
FISI 1019	FISICA EXPERIMENTAL I	1	5.00
HIST 1605A	HISTORIA DE LA CIENCIA (Tipo E)	3	4.15
ISIS 1204	ALGORITMICA Y PROGRAMACION ORIENTADA POR OBJETOS I	3	5.00
LITE 1611	ESPAÑOL	3	4.42
MATE 1204	CALCULO DIFERENCIAL (HONORES)	3	4.65
MUSI 1125A	LA HISTORIA DEL JAZZ	3	4.40

Cred Aprob: 20 Promedio Semestral: 4.62

201510 PRIMER SEMESTRE 2015
Programa: FISICA

Código	Nombre de la Materia	Cred	Nota
DERE 1300	CONSTITUCION Y DEMOCRACIA	3	4.51
FISI 1006A	FISICA PARA VIAJAR A LAS ESTRELLAS	3	4.70
FISI 1028	FISICA II	3	5.00
FISI 1029	FISICA EXPERIMENTAL II	1	4.80
FISI 2026	HERRAMIENTAS COMPUTACIONALES EN CIENCIAS	1	4.80
MATE 1102	MATEMATICA ESTRUCTURAL	3	4.89
MATE 1106	ALGEBRA LINEAL 1 (HONORES)	3	5.00
MATE 1215	CALCULO INTEGRAL CON ECUACIONES DIFERENCIALES (HONORES)	3	4.20
MBIO 1100	BIOLOGIA CELULAR-TEORIA	3	4.25

Cred Aprob: 23 Promedio Semestral: 4.66

201520 SEGUNDO SEMESTRE 2015
Programa: FISICA

Código	Nombre de la Materia	Cred	Nota
CISO 1622B	SEXO, CULTURA Y SOCIEDAD (Tipo E)	3	4.60
FISI 1038	ONDAS Y FLUIDOS	3	5.00
FISI 1039	LABORATORIO DE ONDAS Y FLUIDOS	1	4.90
FISI 1048	FISICA MODERNA	3	4.92
FISI 1049	LABORATORIO DE FISICA MODERNA	3	5.00
LENG 2999	REQUISITO DE LECTURA EN INGLES	0	A
MATE 1107	ALGEBRA LINEAL 2	3	5.00
MATE 1207	CALCULO VECTORIAL	3	5.00
MUSI 1101B	APRECIACION DE BLUES Y ROCK 1	3	4.50
QUIM 1103	QUIMICA	3	4.51

Cred Aprob: 25 Promedio Semestral: 4.81

201610 PRIMER SEMESTRE 2016
Programa: FISICA

Código	Nombre de la Materia	Cred	Nota
FISI 1860	ELECTRONICA	3	4.80
FISI 2040	TERMODINAMICA	3	5.00
FISI 2405	MECANICA	3	4.90
LENG 1301	ALEMAN 1	3	4.00
MATE 2101	ALGEBRA ABSTRACTA 1	3	5.00
MATE 2201	ANALISIS 1	3	4.90
MATE 2301	ECUACIONES DIFERENCIALES	3	4.39

Cred Aprob: 21 Promedio Semestral: 4.71

INFORMACIÓN GENERAL
Un crédito equivale a 48 horas de trabajo académico.

NOTAS NUMÉRICAS
La escala numérica de calificaciones de la Universidad es la siguiente, considerando la nota de TRES (3.00) como la nota mínima aprobatoria.

CINCO (5.00) - CUATRO CINCO (4.50)	EXCELENTE
CUATRO CUARENTA Y NUEVE (4.49) - CUATRO (4.00)	MUY BUENO
TRES NOVENTA Y NUEVE (3.99) - TRES CINCO (3.50)	BUENO
TRES CUARENTA Y NUEVE (3.49) - TRES (3.00)	SATISFACTORIO
DOS NOVENTA Y NUEVE (2.99) - DOS (2.00)	DEFICIENTE
UNO NOVENTA Y NUEVE (1.99) - UNO CINCO (1.50)	MALO
UNO CINCO (1.50)	MÍNIMA

NOTAS ALFABÉTICAS
Los créditos de cursos aprobados cuentan como requisito de grado cuando el programa académico así lo determine, pero no serán tomados en cuenta para el cálculo del promedio semestral ni del ponderado total.

APROBADO (A)
REPROBADO (R)

NOTAS ESPECIALES
I – INCOMPLETO: se aplica cuando el alumno no haya podido cumplir, por razones justificadas, con los requisitos del curso.
IT - INCOMPLETO TOTAL: se aplica cuando el alumno no haya podido cumplir, por razones justificadas, con los requisitos de todos los cursos del período académico en el cual se encuentra matriculado.
P – PENDIENTE: se aplica cuando, para cumplir todos los requisitos del curso, solo le resta al estudiante la presentación de una prueba final que no pueda cumplirse en la fecha fijada, o cuando no puede asignársele una calificación antes del plazo determinado.
PE - PENDIENTE ESPECIAL: se aplica a aquellos estudiantes que se encuentran desarrollando su correspondiente proyecto de grado y que no ha sido concluido dentro del semestre inicialmente establecido.
PD – PENDIENTE DISCIPLINARIO: se aplica a aquellos estudiantes que se encuentran vinculados a un proceso disciplinario.
TR – TRANSFERIDO: se aplica a las materias homologadas que fueron cursadas en otra institución.

PROGRAMAS ESPECIALES
DOBLE PROGRAMA: es la posibilidad de cursar simultáneamente dos programas del mismo nivel de estudios (Pregrado, Especialización ó Maestría).

Universidad de los Andes

CERTIFICADO DE NOTAS

Noviembre 26 de 2018

NOMBRE: BURBANO ALDANA IVAN MAURICIO **CODIGO:** 201423205

NIVEL: PREGRADO **DOC. IDENT:** CC-1019126827

PROGRAMA: FÍSICA **FACULTAD:** CIENCIAS

TITULOS OBTENIDOS: **FECHA GRADO:**

- FÍSICO 23/03/2018

201620 SEGUNDO SEMESTRE 2016
Programa: FISICA

Código	Nombre de la Materia	Cred	Nota
FISI 1003	COLOQUIO 1 DE FISICA	1	4.80
FISI 2007	METODOS MATEMATICOS	3	5.00
FISI 2051	LABORATORIO INTERMEDIO	3	4.66
FISI 2432	ELECTROMAGNETISMO 1	3	4.81
FISI 3000	PRACTICA DOCENTE FISICA	3	4.40
LENG 1302	ALEMAN 2	3	4.22
MATE 3420	TOPOLOGIA 1	3	4.50
MATE 4220	MEDIDA E INTEGRACION	3	4.70

Cred Aprob: 22 Promedio Semestral: 4.62

201710 PRIMER SEMESTRE 2017
Programa: FISICA

Código	Nombre de la Materia	Cred	Nota
FISI 1005	COLOQUIO 2 DE FISICA	1	4.90
FISI 1907B	ASTRONOMIA PLANETARIA	3	5.00
FISI 2028	MÉTODOS COMPUTACIONALES EN CIENCIAS	3	5.00
FISI 2029	LABORATORIO DE MÉTODOS COMPUTACIONALES	1	5.00
FISI 2350	FISICA ATOMICA Y MOLECULAR	3	5.00
FISI 3010	MECANICA CUANTICA I	3	5.00
FISI 3011	SEMINARIO DE FÍSICA TEÓRICA	1	5.00
FISI 3040	FISICA ESTADISTICA	3	5.00
FISI 3434	ELECTROMAGNETISMO 2	3	5.00
LENG 1303	ALEMAN 3	3	4.33
LENG 3999	REQUISITO DOMINIO DE LENGUA EXTRANJERA	0	A

Cred Aprob: 24 Promedio Semestral: 4.91

201720 SEGUNDO SEMESTRE 2017
Programa: FISICA

Código	Nombre de la Materia	Cred	Nota
FISI 3005	TEORIA GRUPOS EN MECANICA CUANTICA	3	5.00
FISI 3020	MECANICA CUANTICA II	3	4.60
FISI 3090	RELATIVIDAD GENERAL Y COSMOLOGIA	4	4.50
FISI 3098	MONOGRAFIA	3	4.80
FISI 3152	FISICA DE PARTICULAS	3	5.00
FISI 3760	FISICA DEL ESTADO SOLIDO	3	4.40
MATE 3422	TOPOLOGIA ALGEBRAICA	3	4.60

Cred Aprob: 22 Promedio Semestral: 4.69

FINAL DE PERIODOS ACADÉMICOS

TOTALES ACUMULADOS: **Cred. Intentados:** 157 **Cred. Aprobados:** 157 **Cred. Transferidos:** 0 **Promedio Acumulado:** 4.72

Dirección de Admisiones y Registro

ESTE CERTIFICADO SOLO ES VÁLIDO CON LA FIRMA AUTORIZADA Y EL SELLO EN ALTO RELIEVE DE LA UNIVERSIDAD

Dirección Admisiones y Registro NIT 860.007.386-1
Calle 18A No. 0-32 Este Edificio E Teléfonos (571) 339 4949 / 99 Ext. 2216 Fax (571) 332 4469
Apartado Aéreo 4976 - http://registro.uniandes.edu.co Bogotá, D.C. - Colombia

INFORMACIÓN GENERAL
Un crédito equivale a 48 horas de trabajo académico.

NOTAS NUMÉRICAS
La escala numérica de calificaciones de la Universidad es la siguiente, considerando la nota de TRES (3.00) como la nota mínima aprobatoria.

CINCO (5.00) - CUATRO CINCO (4.50)	EXCELENTE
CUATRO CUARENTA Y NUEVE (4.49) - CUATRO (4.00)	MUY BUENO
TRES NOVENTA Y NUEVE (3.99) - TRES CINCO (3.50)	BUENO
TRES CUARENTA Y NUEVE (3.49) - TRES (3.00)	SATISFACTORIO
DOS NOVENTA Y NUEVE (2.99) - DOS (2.00)	DEFICIENTE
UNO NOVENTA Y NUEVE (1.99) - UNO CINCO (1.50)	MALO
UNO CINCO (1.50)	MÍNIMA

NOTAS ALFABÉTICAS
Los créditos de cursos aprobados cuentan como requisito de grado cuando el programa académico así lo determine, pero no serán tomados en cuenta para el cálculo del promedio semestral ni del ponderado total.

APROBADO (A)
REPROBADO (R)

NOTAS ESPECIALES
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IT - INCOMPLETO TOTAL: se aplica cuando el alumno no haya podido cumplir, por razones justificadas, con los requisitos de todos los cursos del período académico en el cual se encuentra matriculado.
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Universidad de los Andes

CERTIFICADO DE NOTAS

Noviembre 26 de 2018

NOMBRE:	BURBANO ALDANA IVAN MAURICIO	**CODIGO:**	201423205
NIVEL:	MAGISTER	**DOC. IDENT:**	CC-1019126827
PROGRAMA:	MAESTRÍA EN CIENCIAS-FÍSICA	**FACULTAD:**	CIENCIAS

201810 PRIMER SEMESTRE 2018
Programa: MAESTRIA EN CIENCIAS-FISICA

Código	Nombre de la Materia	Cred	Nota
FISI 4010	MECANICA CUANTICA AVANZADA 1	4	4.40
FISI 4040	MECANICA ESTADISTICA	4	4.10
FISI 4430	ELECTRODINAMICA	4	5.00

Cred Aprob: 12 Promedio Semestral: 4.50

CURSOS HOMOLOGADOS EN PRIMER SEMESTRE 2018

Código	Nombre de la Materia	Cred	Nota
FISI 3090	RELATIVIDAD GRAL Y COSMOLOGIA	4	4.50

Cred Aprob: 4 Promedio Semestral: 4.50

FINAL DE PERIODOS ACADÉMICOS

TOTALES ACUMULADOS: **Cred. Intentados:** 16 **Cred. Aprobados:** 16 **Cred. Transferidos:** 0 **Promedio Acumulado:** 4.50

Dirección de Admisiones y Registro

ESTE CERTIFICADO SOLO ES VÁLIDO CON LA FIRMA AUTORIZADA Y EL SELLO EN ALTO RELIEVE DE LA UNIVERSIDAD

Dirección Admisiones y Registro NIT 860.007.386-1
Calle 18A No. 0-33 Este Edificio E Teléfonos (571) 339 4949 / 99 Ext. 2216 Fax (571) 332 4469
Apartado Aéreo 4976 - http://registro.uniandes.edu.co Bogotá, D.C. - Colombia

INFORMACIÓN GENERAL
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La escala numérica de calificaciones de la Universidad es la siguiente, considerando la nota de TRES (3.00) como la nota mínima aprobatoria.

CINCO (5.00) - CUATRO CINCO (4.50)	EXCELENTE
CUATRO CUARENTA Y NUEVE (4.49) - CUATRO (4.00)	MUY BUENO
TRES NOVENTA Y NUEVE (3.99) - TRES CINCO (3.50)	BUENO
TRES CUARENTA Y NUEVE (3.49) - TRES (3.00)	SATISFACTORIO
DOS NOVENTA Y NUEVE (2.99) - DOS (2.00)	DEFICIENTE
UNO NOVENTA Y NUEVE (1.99) - UNO CINCO (1.50)	MALO
UNO CINCO (1.50)	MÍNIMA

NOTAS ALFABÉTICAS
Los créditos de cursos aprobados cuentan como requisito de grado cuando el programa académico así lo determine, pero no serán tomados en cuenta para el cálculo del promedio semestral ni del ponderado total.

APROBADO (A)
REPROBADO (R)

NOTAS ESPECIALES
I – INCOMPLETO: se aplica cuando el alumno no haya podido cumplir, por razones justificadas, con los requisitos del curso.
IT - INCOMPLETO TOTAL: se aplica cuando el alumno no haya podido cumplir, por razones justificadas, con los requisitos de todos los cursos del período académico en el cual se encuentra matriculado.
P – PENDIENTE: se aplica cuando, para cumplir todos los requisitos del curso, solo le resta al estudiante la presentación de una prueba final que no pueda cumplirse en la fecha fijada, o cuando no puede asignársele una calificación antes del plazo determinado.
PE - PENDIENTE ESPECIAL: se aplica a aquellos estudiantes que se encuentran desarrollando su correspondiente proyecto de grado y que no ha sido concluido dentro del semestre inicialmente establecido.
PD – PENDIENTE DISCIPLINARIO: se aplica a aquellos estudiantes que se encuentran vinculados a un proceso disciplinario.
TR – TRANSFERIDO: se aplica a las materias homologadas que fueron cursadas en otra institución.

PROGRAMAS ESPECIALES
DOBLE PROGRAMA: es la posibilidad de cursar simultáneamente dos programas del mismo nivel de estudios (Pregrado, Especialización ó Maestría).

Universidad de los Andes

LA SUSCRITA DIRECTORA DE LA OFICINA DE ADMISIONES Y REGISTRO DE LA UNIVERSIDAD DE LOS ANDES
RECONOCIMIENTO COMO UNIVERSIDAD: DECRETO 1297 DEL 30 DE MAYO DE 1964
RECONOCIMIENTO PERSONERÍA JURÍDICA: RESOLUCIÓN 28 DEL 23 DE FEBRERO DE 1949 MINJUSTICIA
NIT. 860.007.386-1

C E R T I F I C A:

Que el señor IVAN MAURICO BURBANO ALDANA, identificado con Cédula de Ciudadanía No. 1.019.126.827, está matriculado en el programa de MAESTRÍA EN CIENCIAS FÍSICA de esta Universidad para el segundo semestre de 2018, cuyas clases iniciaron el 06 de agosto y finalizan el 11 de diciembre. Para el mencionado semestre el señor Burbano inscribió las siguientes materias:

CÓDIGO	NOMBRE DE LA MATERIA	CRÉDITO
FISI 4013	SEMINARIO 1 DE TEORIA CUÁNTICA DE CAMPOS	3
FISI 4051	LABORATORIO AVANZADO	4
FISI 4405	MECÁNICA ANALÍTICA	4

ESTA CONSTANCIA SE EXPIDE A SOLICITUD DEL INTERESADO.

CLAUDIA MARGARITA MEZA BOTERO
Directora
Oficina de Admisiones y Registro

Bogotá, octubre 30 de 2018
M.Peña

[Logo of Universidad de Los Andes]

ACADEMIC TRANSCRIPT

November 26, 2018

STUDENT: BURBANO ALDANA IVAN MAURICIO **CODE:** 201423205

LEVEL: UNDERGRADUATE **ID:** NATIONAL CITIZEN CARD 1019126827

PROGRAM: PHYSICS **FACULTY:** SCIENCES

DEGREE OBTAINED:

- PHYSICIST

GRADUATION DATE:

- 23/03/2018

201420 SECOND SEMESTER 2014

Program: Physics

Code	COURSE TITLE	Credits	Grade
FISI 1002	INTRODUCTION TO PHYSICS	1	A
FISI 1018	PHYSICS I	3	5.00
FISI 1019	EXPERIMENTAL PHYSICS I	1	5.00
HIST1605	HISTORY OF SCIENCE (TYPE E)	3	4.15
ISIS 1204	OBJECT ORIENTED ALGORITHMICS AND PROGRAMMING	3	5.00
LITE1611	SPANISH	3	4.42
MATE 1204	DIFFERENTIAL CALCULUS (HONORS)	3	4.65
MUSI 1125A	HISTORY OF JAZZ	3	4.40
	Approved Credits: 20 Semester average: 4.62		

201510 FIRST SEMESTER 2015

Program: Physics

Code	Course Name	Credits	Grade
DERE 1300	CONSTITUTION AND DEMOCRACY	3	4.51
FISI 1006A	PHYSICS TO TRAVEL TO THE STARS	3	4.70
FISI 1028	PHYSICS II	3	5.00
FISI 1029	EXPERIMENTAL PHYSICS II	1	4.80
FISI 2026	COMPUTATIONAL TOOLS IN SCIENCES	1	4.80
MATE 1102	STRUCTURAL MATHEMATICS	3	4.89
MATE 1106	LINEAR ALGEBRA 1 (HONORS)	3	5.00
MATE 1215	INTEGRAL CALCULUS WITH DIFFERENTIAL EQUATIONS (HONORS)	3	4.20
MBIO 1100	CELLULAR BIOLOGY - THEORY	3	4.25
	Approved Credits: 23 Semester average: 4.66		

201520 SECOND SEMESTER 2015

Program: Physics

Code	Course Title	Credits	Grade
CISO 1622B	SEX CULTURE AND SOCIETY (TYPE E)	3	4.60
FISI 1038	WAVES AND FLUIDS	3	5.00
FISI 1039	WAVES AND FLUIDS LAB	1	4.90
FISI 1048	MODERN PHYSICS	3	4.92
FISI 1049	MODERN PHYSICS LAB	3	5.00
LENG 2999	ENGLISH READING REQUIREMENT	0	A
MATE 1107	LINEAR ALGEBRA 2	3	5.00
MATE 1207	VECTOR CALCULUS	3	5.00
MUSI 1101B	BLUES AND ROCK APPRECIATION	3	4.50
QUIM 1103	CHEMISTRY	3	4.51
	Approved Credits: 25 Semester average: 4.81		

201610 FIRST SEMESTER 2016

Program: Physics

Code	Course Title	Credits	Grade
FISI 1860	ELECTRONICS	3	4.80
FISI 2040	THERMODYNAMICS	3	5.00
FISI 2405	MECHANICS	3	4.90
LENG 1301	GERMAN 1	3	4.00
MATE 2101	ABSTRACT ALGEBRA 1	3	5.00
MATE 2201	ANALYSIS 1	3	4.90
MATE 2301	DIFFERENTIAL EQUATIONS	3	4.39
	Approved Credits: 21 Semester average: 4.71		

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Calle 18A # 0-33 East Building E Telephone [571] 339 4949 /99 Ext. 2216 Fax [571] 332 4469

ZIP CODE 4976 – http://registro.uniandes.edu.co - Bogota, D.C. – Colombia

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GENERAL INFORMATION

A Credit is equivalent to 48 hours of academic work

NUMERIC GRADES

The numeric grading scale of “Universidad de los Andes” is the following:

THREE (3) is the minimum passing grade.

FIVE (5.00)- FOUR POINT FIVE (4.50)	EXCELLENT
FOUR FORTY-NINE (4.49)- FOUR (4.00)	VERY GOOD
THREE POINT NINETY-NINE (3.99) – THREE POINT FIVE (3.50)	GOOD
THREE POINT FORTY-NINE (3.49) – THREE (3.00)	SATISFACTORY
TWO POINT NINETY-NINE (2.99)- TWO (2.00)	DEFICIENT
ONE POINT NINETY-NINE (1.99) – ONE POINT FIVE (1.50)	BAD
ONE POINT FIVE (1.50)	MINIMUM

ALPHABETIC GRADES:

Credits of courses that are graduation requirements, as per the academic program, shall not be taken into account for semester and general average calculation purposes.

APPROVED (A)
FAILED (F)

SPECIAL NOTES

I- INCOMPLETE:	The student has not been able to fulfill the requirements of the course due to justified reasons
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PD – DISCIPLIANRY PENDING:	It is applied to those students involved in a disciplinary process
TR – TRANSFERRED:	It is applied to equivalent courses attended at other institutions

SPECIAL PROGRAMS

DOUBLE PROGAM: A student may be enrolled in two programs of the same academic level (Bachelor, Specialization, Master).

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[Logo of Universidad de Los Andes]

ACADEMIC TRANSCRIPT

November 26, 2018

STUDENT: BURBANO ALDANA IVAN MAURICIO **CODE:** 201423205

LEVEL: UNDERGRADUATE **ID:** NATIONAL CITIZEN CARD 1019126827

PROGRAM: PHYSICS **FACULTY:** SCIENCES

DEGREE OBTAINED:

- PHYSICIST

GRADUATION DATE:

- 23/03/2018

201620 SECOND SEMESTER 2016

Program: Physics

Code	Course Title	Credits	Grade
FISI 1003	PHYSICS COLLOQUIUM 1	1	4.80
FISI 2007	MATHEMATICAL METHODS	3	5.00
FISI 2051	INTERMEDIATE LAB	3	4.66
FISI 2432	ELECTROMAGNETISM 1	3	4.81
FISI 3000	PHYSICS TEACHING PRACTICE	3	4.40
LENG 1302	GERMAN 2	3	4.22
MATE 3420	TOPOLOGY I	3	4.50
MATE 4220	MEASURE AND INTEGRATION	3	4.70

Approved Credits: 22 Semester average: 4.62

201710 FIRST SEMESTER 2017

Program: Physics

Code	Course Title	Credits	Grade
FISI 1005	PHYSICS COLLOQUIUM 2	1	4.90
FISI 1907B	PLANETARY ASTRONOMY	3	5.00
FISI 2028	COMPUTATIONAL METHODS IN SCIENCES	3	5.00
FISI 2029	COMPUTATIONAL METHODS LAB	1	5.00
FISI 2350	ATOMIC AND MOLECULAR PHYSICS	3	5.00
FISI 3010	QUANTUM MECHANICS I	3	5.00
FISI 3011	THEORETICAL PHYSICS SEMINAR	1	5.00
FISI 3040	STATISTICAL PHYSICS	3	5.00
FISI 3434	ELECTROMAGNETISM 2	3	5.00
LENG 1303	GERMAN 3	3	4.33
LENG 3999	FOREIGN LANGUAGE REQUIREMENT	0	A

Approved Credits: 24 Semester average: 4.91

201720 SECOND SEMESTER 2017

Program: Physics

Code	Course Title	Credits	Grade
FISI 3005	GROUP THEORY IN QUANTUM MECHANICS	3	5.00
FISI 3020	QUANTUM MECHANICS II	3	4.60
FISI 3090	GENERAL RELATIVITY AND COSMOLOGY	4	4.50
FISI 3098	MONOGRAPH	3	4.80
FISI 3152	PARTICLE PHYSICS	3	5.00
FISI 3760	SOLID STATE PHYSICS	3	4.40
MATE 3422	ALGEBRAIC TOPOLOGY	3	4.60
	Approved Credits: 22 Semester average: 4.69		

END OF ACADEMIC PERIODS

ACCUMULATED TOTALS:

Attempted Credits: 157 **Approved Credits: 157**

Transferred Credits: 0 **Average: 4.72**

[Signature Appears] [Raised Seal - Universidad de los Andes]

Records and Admission Office

THIS CERTIFICATE IS VALID ONLY IF BEARING UNIVERSITY's AUTHORIZED SIGNATURE AND RAISED SEAL

Records and Admission Office NIT 860.007.386-1

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THREE POINT FORTY-NINE (3.49) – THREE (3.00)	SATISFACTORY
TWO POINT NINETY-NINE (2.99)- TWO (2.00)	DEFICIENT
ONE POINT NINETY-NINE (1.99) – ONE POINT FIVE (1.50)	BAD
ONE POINT FIVE (1.50)	MINIMUM

ALPHABETIC GRADES:

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APPROVED (A)
FAILED (F)

SPECIAL NOTES

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[Logo of Universidad de Los Andes]

ACADEMIC TRANSCRIPT

November 26, 2018

STUDENT: BURBANO ALDANA IVAN MAURICIO **CODE:** 201423205

LEVEL: MASTER'S **ID:** NATIONAL CITIZEN CARD 1019126827

PROGRAM: MASTER'S IN SCIENCES-PHYSICS **FACULTY:** SCIENCES

201810 FIRST SEMESTER 2018

Program: MASTER'S IN SCIENCE-PHYSICS

Code	COURSE TITLE	Credits	Grade
FISI 4010	ADVANCED QUANTUM MECHANICS 1	4	4.40
FISI 4040	STATISTICAL MECHANICS	4	4.10
FISI 4430	ELECTRODYNAMICS	4	5.00
	Approved Credits: 12 Semester average: 4.50		

INTERNALLY VALIDATED COURSES IN THE FIRST SEMESTER 2018

Code	COURSE TITLE	Credits	Grade
FISI 3090	GENERAL RELATIVITY AND COSMOLOGY	4	4.50
	Approved Credits: 4 Semester average: 4.50		

END OF ACADEMIC PERIODS

ACCUMULATED TOTALS:

Attempted Credits: 16 **Approved Credits: 16**

Transferred Credits: 0 **Average: 4.50**

[Signature Appears] [Raised Seal - Universidad de los Andes]

Records and Admission Office

THIS CERTIFICATE IS VALID ONLY IF BEARING UNIVERSITY's AUTHORIZED SIGNATURE AND RAISED SEAL

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THE UNDERSIGNED HEAD OF THE ADMISSIONS AND RECORDS OFFICE
OF UNIVERSIDAD DE LOS ANDES
UNIVERSITY RECOGNITION: DECREE 1297 ISSUED ON MAY 30, 1964
LEGAL IDENTITY RECOGNITION: RESOLUTION 28 ISSUED ON FEBRUARY 23, 1949 BY THE MINISTRY OF JUSTICE
NIT. 860.007.386-1

CERTIFIES:

That Mr. **IVAN MAURICIO BURBANO ALDANA**, identified with National Citizenship Card No. 1.019.126.827, is enrolled in the MASTER'S IN SCIENCES PHYSICS program in the second semester of 2018, whose courses began on August 06 and will end on December 11. The student picked the following courses for the aforementioned semester:

CODE	COURSE TITLE	CREDIT
FISI 4013	QUANTUM FIELD THEORY SEMINAR 1	3
FISI 4051	ADVANCED LAB	4
FISI 4405	ANALYTICAL MECHANICS	4

This certification is issued at concerned party request.

[Signature Appears]

_____

CLAUDIA MARGARITA MEZA BOTERO
Head
Admissions and Records Office

Bogota, October 30, 2018
M. Pena

Records and Admission Office NIT 860.007.386-1

Calle 18A # 0-33 East Building E Telephone [571] 339 4949 /99 Ext. 2216 Fax [571] 332 4469

ZIP CODE 4976 – http://registro.uniandes.edu.co - Bogota, D.C. – Colombia

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Cra. 19 # 63-27, Bogotá, Colombia

November 30, 2018

2019 Perimeter Scholars International
Perimeter Institute for Theoretical Physics

Dear Admissions Committee:

I first watched Prof. Bender's incredible lectures on mathematical physics during my first year as an undergraduate. Since then, I have known that Perimeter is the right place for me. It is now my turn to show you why I am the right student for Perimeter.

The research I have done up till now lies on the intersection between mathematics and physics. I have particularly focused on the algebraic approach to quantum physics. During my undergraduate degree, my thesis was based on the relationship between KMS states and Tomita-Takesaki theory. That is when I first learned of the thermal time hypothesis. The beauty behind it led me to the research I am doing at the moment. I am currently working on a paper with A. P. Balachandran, A. F. Reyes-Lega and S. Tabban where we explore the appearence of gauge symmetries when calculating the entropy of algebraic states. We further explain these in terms of quantum operations. This work is deeply rooted within the Perimeter community, as one of the starting points was the ambiguity pointed out by Prof. R. Sorkin on our entropy calculations. On the other hand, I believe these ambiguities may be connected to Connes' proposal of quantum time as a one parameter group of **outer** automorphisms. This is the result of the application of noncommutative geometry to physics, a research field to which Prof. M. Marcolli has been instrumental.

I applied last year to the program. Although my application was received as exceptional, Perimeter was unable to offer me a position. As a result of my participation in the school Journeys into Theoretical Physics, I was awarded a fellowship for a joint masters program between ICTP-SAIFR/IFT-UNESP and Perimeter. I am truly grateful for this second opportunity and I promise to make the best out of it. I expect to be able to learn as much as I can from the incredible scientists mentioned above. Moreover, I believe this is a great opportunity to forge scientific relations with them which may lead to new research.

Sincerely,

Iván Mauricio Burbano Aldana