



ALESSANDRO CODELLO  
PhD in Theoretical Physics

### SNI

Ciencias Naturales y Exactas / Ciencias Físicas  
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## Datos Generales

### INSTITUCIÓN PRINCIPAL

Universidad de la República/ Facultad de Ingeniería - UDeLaR / Uruguay

### DIRECCIÓN INSTITUCIONAL

Institución: Universidad de la República / Facultad de Ingeniería - UDeLaR / Sector Educación Superior/Público  
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## Formación

### Formación académica

#### CONCLUIDA

#### DOCTORADO

##### PhD (2007 - 2010)

Johannes Gutenberg-Universität Mainz , Alemania  
Título de la disertación/tesis/defensa: A Novel Functional Renormalization Group Approach to Gauge Theories and Gravity  
Tutor/es: Martin Reuter  
Obtención del título: 2010  
Palabras Clave: Renormalization Group Quantum Gravity

### Formación complementaria

#### CONCLUIDA

#### POSDOCTORADOS

##### CP3 Origins (2014 - 2016)

Sector Extranjero/Internacional/Otros / University of Southern Denmark , Dinamarca

##### SISSA Trieste (2011 - 2013)

Sector Extranjero/Internacional/Otros / Scuola Internazionale Superiore di Studi Avanzati, Trieste , Italia

## Idiomas

#### Inglés

Entiende muy bien / Habla muy bien / Lee muy bien / Escribe muy bien

#### Español

Entiende bien / Habla regular / Lee bien / Escribe regular

#### Italiano

Entiende muy bien / Habla muy bien / Lee muy bien / Escribe muy bien

## Áreas de actuación

## CIENCIAS NATURALES Y EXACTAS

Ciencias Físicas /Física de Partículas y Campos

### Producción científica/tecnológica

La clasificación de clases de universalidad de equilibrio (UC) ha sido uno de los mayores éxitos de la física teórica y se produjeron muchas ideas matemáticas y teóricas importantes para completar este esfuerzo, de manera destacada el Grupo de Renormalización (RG) y la Teoría de Campos Conformales (CFT).

Personalmente, he contribuido explorando UC escalares de un solo componente multicríticas en  $d > 2$  aplicando una combinación de técnicas analíticas disponibles: RG no perturbativo (NPRG), e-expansión y CFT. En el proceso se descubrieron muchos UC nuevos en  $d = 4$  y  $d = 3$ , mientras que en presencia de simetría global aclaré el diagrama de fase de los modelos O(N) y Potts.

También he investigado el problema de construir una teoría de la gravedad cuántica que demuestre que, bajo ciertos supuestos, es asintóticamente segura. Si esto se confirma con más estudios, puede servir como base para la construcción de una teoría de la gravedad que vaya más allá de Einstein.

### Producción bibliográfica

#### ARTÍCULOS PUBLICADOS

##### ARBITRADOS

##### **Symmetry and universality of multifield interactions in 6-epsilon dimensions (Completo, 2020)**

Alessandro Codello, M. Safari, G.P. Vacca, O. Zanusso  
Physical Review D - Particles, Fields, Gravitation and Cosmology, 2020  
ISSN: 15507998  
DOI: <https://doi.org/10.1103/PhysRevD.101.065002>

##### **Criticality of spin systems with weak long-range interactions (Completo, 2020)**

Alessandro Codello, Nicolò Defenu, Stefano Ruffo, Andrea Trombettoni  
Journal of Physics A: Mathematical and Theoretical, 2020  
ISSN: 17518113  
DOI: <https://doi.org/10.1088/1751-8121/ab6a6c>  
Scopus\*

##### **Platonic Field Theories (Completo, 2019)** Trabajo relevante

Alessandro Codello, Riccardo Ben Ali Zinati, Giacomo Gori  
Journal of High Energy Physics, 2019  
ISSN: 10298479  
DOI: [https://doi.org/10.1007/JHEP04\(2019\)152](https://doi.org/10.1007/JHEP04(2019)152)  
Scopus\* WEB OF SCIENCE™

##### **Leading order CFT analysis of multi-scalar theories in $d > 2$ (Completo, 2019)** Trabajo relevante

Alessandro Codello, M. Safari, G. P. Vacca, O. Zanusso  
European Physical Journal C, 2019  
ISSN: 14346044  
DOI: <https://doi.org/10.1140/epjc/s10052-019-6817-1>  
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##### **Scaling solutions in the derivative expansion (Completo, 2018)**

Alessandro Codello, N. Defenu  
Physical Review D - Particles, Fields, Gravitation and Cosmology, 2018  
ISSN: 15507998  
DOI: <https://doi.org/10.1103/PhysRevD.98.016013>

##### **Functional RG approach to the Potts model (Completo, 2018)**

Alessandro Codello, Riccardo Ben Ali Zinati  
Journal of Statistical Mechanics, 2018  
ISSN: 17425468  
DOI: <https://doi.org/10.1088/1742-5468/aa9dcc>  
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**Functional perturbative RG and CFT data in the epsilon-expansion (Completo, 2018)** Trabajo relevante

Alessandro Codello, M. Safari, G. P. Vacca, O. Zanusso  
European Physical Journal C (E), 2018  
ISSN: 14346052  
DOI: <https://doi.org/10.1140/epjc/s10052-017-5505-2>  
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**A Unified Universe (Completo, 2018)**

Alessandro Codello, Rajeev Kumar Jain  
European Physical Journal C (E), 2018  
ISSN: 14346052  
DOI: <https://doi.org/10.1140/epjc/s10052-018-5839-4>  
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**New universality class in three dimensions: The critical Blume-Capel model (Completo, 2017)**

Alessandro Codello, M. Safari, G.P. Vacca, O. Zanusso  
Physical Review D - Particles, Fields, Gravitation and Cosmology, 2017  
ISSN: 15507998  
DOI: <https://doi.org/10.1103/PhysRevD.96.081701>

**Leading CFT constraints on multi-critical models in  $d > 2$  (Completo, 2017)**

Alessandro Codello, M. Safari, G.P. Vacca, O. Zanusso  
Journal of High Energy Physics, 2017  
ISSN: 10298479  
DOI: [https://doi.org/10.1007/JHEP04\(2017\)127](https://doi.org/10.1007/JHEP04(2017)127)  
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**On the covariant formalism of the effective field theory of gravity and its cosmological implications (Completo, 2017)**

Alessandro Codello, Rajeev Kumar Jain  
Classical and Quantum Gravity, 2017  
ISSN: 02649381  
DOI: <https://doi.org/10.1088/1361-6382/aa549d>  
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**Leading Gravitational Corrections and a Unified Universe (Completo, 2016)**

Alessandro Codello, Rajeev Kumar Jain  
International Journal of Modern Physics D, 2016  
Escrito por invitación  
ISSN: 02182718  
DOI: <https://doi.org/10.1142/S0218271816440235>  
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**Conformal Gauge-Yukawa Theories away From Four Dimensions (Completo, 2016)**

Alessandro Codello, F. Sannino, D.F. Litim, K. Langæble  
Journal of High Energy Physics, 2016  
ISSN: 10298479  
DOI: [https://doi.org/10.1007/JHEP07\(2016\)118](https://doi.org/10.1007/JHEP07(2016)118)  
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**On the covariant formalism of the effective field theory of gravity and leading order corrections (Completo, 2016)**

Alessandro Codello, Rajeev Kumar Jain  
Classical and Quantum Gravity, 2016

ISSN: 02649381

DOI: <https://doi.org/10.1088/0264-9381/33/22/225006>

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**Computing the Effective Action with the Functional Renormalization Group (Completo, 2016)**

Alessandro Codello , R. Percacci , A. Tonero , L. Rachwal

European Physical Journal C (E), 2016

ISSN: 14346052

DOI: <https://doi.org/10.1140/epjc/s10052-016-4063-3>

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**Renormalization group improved computation of correlation functions in theories with nontrivial phase diagram (Completo, 2016)**

Alessandro Codello , A. Tonero

Physical Review D - Particles, Fields, Gravitation and Cosmology, 2016

ISSN: 15507998

DOI: <https://doi.org/10.1103/PhysRevD.94.025015>

**Renormalization group flow equations for the proper vertices of the background effective average action (Completo, 2015)**

Alessandro Codello

Physical Review D - Particles, Fields, Gravitation and Cosmology, 2015

ISSN: 15507998

DOI: <https://doi.org/10.1103/PhysRevD.91.065032>

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**Approximating the Ising model on fractal lattices of dimension less than two (Completo, 2015)**

Alessandro Codello , Vincent Drach , Ari Hietanen

Journal of Statistical Mechanics, 2015

ISSN: 17425468

DOI: <https://doi.org/10.1088/1742-5468/2015/11/P11008>

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**Functional and Local Renormalization Groups (Completo, 2015)**

Alessandro Codello , C. Pagani , G. D'Odorico

Physical Review D - Particles, Fields, Gravitation and Cosmology, 2015

ISSN: 15507998

DOI: <https://doi.org/10.1103/PhysRevD.91.125016>

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**Critical exponents of O(N) models in fractional dimensions (Completo, 2015)**

Alessandro Codello , Nicolás Defenu , Giulio D'Odorico

Physical Review D - Particles, Fields, Gravitation and Cosmology, 2015

ISSN: 15507998

DOI: <https://doi.org/10.1103/PhysRevD.91.105003>

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**Fixed-point structure and effective fractional dimensionality for O(N) models with long-range interactions (Completo, 2015)**

Alessandro Codello , Nicolás Defenu , Andrea Trombettoni

Physical Review E - Statistical Physics, Plasmas, Fluids and Related Interdisciplinary Topics, 2015

ISSN: 1063651X

DOI: <https://doi.org/10.1103/PhysRevE.92.052113>

**Marginally Deformed Starobinsky Gravity (Completo, 2015)**

Alessandro Codello , F. Sannino , J. Joergensen , O. Svendsen

Journal of High Energy Physics, 2015

ISSN: 10298479

DOI: [https://doi.org/10.1007/JHEP02\(2015\)050](https://doi.org/10.1007/JHEP02(2015)050)

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**Consistent closure of renormalization group flow equations in quantum gravity (Completo, 2014)**

Alessandro Codello, C. Pagani, G. D'Odorico  
Physical Review D - Particles, Fields, Gravitation and Cosmology, 2014  
ISSN: 15507998  
DOI: <https://doi.org/10.1103/PhysRevD.89.081701>  
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**Scaling and Renormalization in two dimensional Quantum Gravity (Completo, 2014)**

Alessandro Codello, G. D'Odorico  
Physical Review D - Particles, Fields, Gravitation and Cosmology, 2014  
ISSN: 15507998  
DOI: <https://doi.org/10.1103/PhysRevD.92.024026>  
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**A functional RG equation for the c-function (Completo, 2014)**

Alessandro Codello, C. Pagani, G. D'Odorico  
Journal of High Energy Physics, 2014  
ISSN: 10298479  
DOI: [https://doi.org/10.1007/JHEP07\(2014\)040](https://doi.org/10.1007/JHEP07(2014)040)  
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**Scheme dependence and universality in the functional renormalization group (Completo, 2014)**

Alessandro Codello, M. Demmel, O. Zanusso  
Physical Review D - Particles, Fields, Gravitation and Cosmology, 2014  
ISSN: 15507998  
DOI: <https://doi.org/10.1103/PhysRevD.90.027701>  
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**Quantum corrections in Galileon theories (Completo, 2014)**

Alessandro Codello, N. Brouzakis, O. Zanusso, N. Tetradis  
Journal of High Energy Physics, 2014  
ISSN: 10298479  
DOI: <https://doi.org/10.1103/PhysRevD.89.125017>  
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**O(N)-Universality Classes and the Mermin-Wagner Theorem (Completo, 2013) Trabajo relevante**

Alessandro Codello, G. D'Odorico  
Physical Review Letters, 2013  
ISSN: 00319007  
DOI: <https://doi.org/10.1103/PhysRevLett.110.141601>  
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**The Renormalization Group and Weyl-invariance (Completo, 2013)**

Alessandro Codello, G. D'Odorico, C. Pagani, R. Percacci  
Classical and Quantum Gravity, 2013  
ISSN: 02649381  
DOI: <https://doi.org/10.1088/0264-9381/30/11/115015>  
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**Scaling Solutions in Continuous Dimension (Completo, 2013)**

Alessandro Codello  
Journal of Physics A: Mathematical and Theoretical, 2013  
ISSN: 17518113  
DOI: <https://doi.org/10.1088/1751-8113/45/46/465006>  
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**On the non-local heat kernel expansion (Completo, 2013)**

Alessandro Codello, O. Zanusso  
Journal of Mathematical Physics, 2013  
ISSN: 00222488  
DOI: <https://doi.org/10.1063/1.4776234>  
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### **Renormalization Group Flow of Hexatic Membranes (Completo, 2013)**

Alessandro Codello, O. Zanusso  
Physical Review E, Statistical, Nonlinear, and Soft Matter Physics, 2013  
ISSN: 15393755  
DOI: <https://doi.org/10.1103/PhysRevE.88.022135>  
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### **Fluid Membranes and 2d Quantum Gravity (Completo, 2011)**

Alessandro Codello, O. Zanusso  
Physical Review D - Particles, Fields, Gravitation and Cosmology, 2011  
ISSN: 15507998  
DOI: <https://doi.org/10.1103/PhysRevD.83.125021>  
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### **Exact Curie temperature for the Ising model on Archimedean and Laves lattices (Completo, 2010)**

Alessandro Codello  
Journal of Physics A: Mathematical and Theoretical, 2010  
ISSN: 17518113  
DOI: <https://doi.org/10.1088/1751-8113/43/38/385002>  
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### **Low energy Quantum Gravity from the Effective Average Action (Completo, 2010)**

Alessandro Codello, A. Satz, F.D. Mazzitelli  
Physical Review D - Particles, Fields, Gravitation and Cosmology, 2010  
ISSN: 15507998  
DOI: <https://doi.org/10.1103/PhysRevD.82.084011>  
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### **Fixed Points of Nonlinear Sigma Models in $d > 2$ (Completo, 2009)**

Alessandro Codello, R. Percacci  
Physics Letters B, 2009  
ISSN: 03702693  
DOI: <https://doi.org/10.1016/j.physletb.2009.01.032>  
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### **Investigating the Ultraviolet Properties of Gravity with a Wilsonian Renormalization Group Equation (Completo, 2009)**

Alessandro Codello, R. Percacci, Christoph Rahmede  
Annals of Physics (New York), 2009  
ISSN: 00034916  
DOI: <https://doi.org/10.1016/j.aop.2008.08.008>  
Scopus<sup>®</sup> WEB OF SCIENCE<sup>™</sup>

### **Ultraviolet properties of $f(R)$ -gravity (Completo, 2008)**

Alessandro Codello, R. Percacci, C. Rahmede  
International Journal of Modern Physics A, 2008  
ISSN: 0217751X  
DOI: <https://doi.org/10.1142/S0217751X08038135>  
Scopus<sup>®</sup> WEB OF SCIENCE<sup>™</sup>

### **Fixed points of higher derivative gravity (Completo, 2006) Trabajo relevante**

Alessandro Codello, Roberto Percacci  
Physical Review Letters, 2006  
ISSN: 00319007  
Scopus<sup>®</sup> WEB OF SCIENCE<sup>™</sup>

### **NO ARBITRADOS**

### **The renormalization of fluctuating branes, the Galileon and asymptotic safety (Completo, 2013)**

Alessandro Codello, O. Zanusso, N. Tetradis

Journal of High Energy Physics, 2013  
ISSN: 10298479  
DOI: [https://doi.org/10.1007/JHEP04\(2013\)036](https://doi.org/10.1007/JHEP04(2013)036)

**Polyakov Effective Action from Functional Renormalization Group Equation (Completo, 2010)**

Alessandro Codello

Annals of Physics (E), 2010  
ISSN: 1096035X  
DOI: <https://doi.org/10.1016/j.aop.2010.04.013>

## Indicadores de producción

<b>PRODUCCIÓN BIBLIOGRÁFICA</b>	<b>41</b>
<b>Artículos publicados en revistas científicas</b>	<b>41</b>
Completo	41