STORIE NATURALI

Stefano Forte
Dipartimento di Fisica dell'Università and INFN, Milano

Latorrefest: Barcelona, May 31, 2019

Primo Levi

Storie naturali

Einaudi

Citation summary results	Citeable papers	Published only
Total number of papers analyzed:	116	89
Total number of citations:	9,760	8,842
Average citations per paper:	84.1	99.3
Breakdown of papers by citations:		
Renowned papers (500+)	4	4
Famous papers (250-499)	5	4
Very well-known papers (100-249)	14	12

PERE PASCUAL (1934-2006)

Citation summary results	Citeable papers	Published only
Total number of papers analyzed:	116	89
Total number of citations:	9,760	8,842
Average citations per paper:	84.1	99.3
Breakdown of papers by citations:		
Renowned papers (500+)	4	4
Famous papers (250-499)	5	4
Very well-known papers (100-249)	14	12

- RENOWNED: 1 Quantum Information
  3 QCD (NNPDF)
- FAMOUS: 4 QCD (NNPDF)
- V. WELL-KNOWN: 1 Quantum Information
  2 QCD (ChPT),
  4 Quantum Field Theory
  7 QCD (NNPDF)

JIL+SF

Citation summary results	Citeable papers	Published only
Total number of papers analyzed:	37	20
Total number of citations:	6,601	5,735
Average citations per paper:	178.4	286.8
Breakdown of papers by citations:		
Renowned papers (500+)	3	3
Famous papers (250-499)	5	4
Very well-known papers (100-249)	7	5

Particle Physics

Cargèse 1985

Edited by

Maurice Lévy
Jean-Louis Basdevant
Maurice Jacob
David Speiser
Jacques Weyers and
Raymond Gastmans

NATO ASI Series

Series B: Physics Vol. 150

EMAIL IN 1984

BITNET

From Wikipedia, the free encyclopedia

This article **needs additional citations for verification**. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.
Find sources: "BITNET" – news · newspapers · books · scholar · JSTOR *(August 2010) (Learn how and when to remove this template message)*

BITNET was a co-operative U.S. university computer network founded in 1981 by Ira Fuchs at the City University of New York (CUNY) and Greydon Freeman at Yale University.[1] The first network link was between CUNY and Yale.

The name BITNET originally meant "Because It's There Network", but it eventually came to mean "Because It's Time Network". [2]

A college or university wishing to join BITNET was required to lease a data circuit (phone line) from a site to an existing BITNET node, buy modems for each end of the data circuit, sending one to the connecting point site, and allow other institutions to connect to its site free of charge.

TRIVIALITY

PHYSICAL REVIEW D VOLUME 34, NUMBER 8 15 OCTOBER 1986

$\lambda\phi^4$ theory in a time-dependent space-time

J. I. Latorre and P. Pascual
Departament de Física Teòrica, Universitat de Barcelona, Barcelona, Spain

R. Tarrach*
Departament de Física Teòrica, Universitat Autònoma de Barcelona, Barcelona, Spain
(Received 31 March 1986)

We study the triviality problem of $\lambda\phi^4$ theory in a time-dependent space-time within a variational Gaussian approach. A unique, precarious ($\lambda_B \sim -1/\ln\Lambda$) phase makes sense. As a consequence, λ_R is compelled to lie in the range $0 \geq \lambda_R > \lambda_{R_{\min}}$, where $\lambda_{R_{\min}}$ depends on the curvature.

I. INTRODUCTION

Recently the problem of the existence of $\lambda\phi^4$ theory has been studied, we believe, for the first time in a curved space-time.[1] The reason is the accumulating evidence for the triviality of $\lambda\phi^4$ theory in Minkowski space,[2] only counterbalanced by the possible existence of a precarious phase, that is, a phase which does not lead to a sound regularized theory, but nevertheless yields an interacting renormalized theory with a ground state.[3] This precariousness is due to the fact that the bare coupling constant is negative in this phase. More rigorously, this does not seem to spoil the construction of Euclidean $\lambda\phi^4$ theory, but its continuation to Minkowski space is not understood.[4] Now, the question addressed in Ref. 1 is about the role played by curvature in the triviality and interaction issue of $\lambda\phi^4$ theory. Naively one could argue that the existence and interaction are determined by the continuum (regularized to renormalized) limit and thus are only ultraviolet sensitive. When the distance goes to zero, curvature becomes meaningless. However, the issues studied do not depend only on the leading UV divergences, but also on subleading contributions, and these depend on finite distances. In the language of perturbation theory this implies, e.g., that overlapping divergences are curvature sensitive. In Ref. 1 the space-time chosen was a static Robertson-Walker one. The main reason for this choice was the existence of relatively simple solutions of the Klein-Gordon equation in this space-time, an essential ingredient to the variational approach followed. The penalty for this simplicity was a space-time which does not differ very much from Minkowski space-time. Its high degree of symmetry and its static character make important qualitative changes unlikely. Here a similar study has been performed for the simplest time-dependent space-time. We have not given up symmetry; on the contrary, the group of isometries is maximal, but now there is an explicit time dependence in the metric. Of course, the choice has been again constrained by the requirement of the existence of not-too-difficult solutions to the Klein-Gordon equation. Therefore, the question raised, and answered, within the approximations used, is as follows: How relevant is the static character of the curved space-time for the existence issue of $\lambda\phi^4$ theory?

We quickly recall the conclusions of Ref. 1. For a static Robertson-Walker space-time the only interacting phase with ground state is precarious, exactly as for Minkowski space-time. However, the range of allowed values of the renormalized coupling constant depends on the curvature. For a closed space-time the range shrinks to zero as the curvature becomes large. For an open space-time the range becomes unbounded, allowing arbitrarily large negative values, as the curvature increases. These results are a reflection of asymptotic freedom, as for negative coupling $\lambda\phi^4$ theory is asymptotically free.[5]

We will now study the same issues in a time-dependent space-time and so analyze the role that time dependence plays with respect to interaction, precariousness, and existence of the ground state.

Let us briefly review here the main ideas behind our approach to the study of these problems. Recall that there are two equivalent definitions of the effective potential of a field theory.[6] One corresponds to the lowest expectation value of the Hamiltonian when the states are constrained to lead to a fixed field expectation value, i.e.,

$$V(\phi_0) \equiv \min \langle \psi | H | \psi \rangle \,, \qquad \phi_0 = \langle \psi | \phi | \psi \rangle \,. \tag{1.1}$$

This is the definition that will allow us to compute an approximate effective potential density with the help of a variational approach, as is clear from Eq. (1.1). We will make a free-field ansatz which is known as the Gaussian approximation[7,3] and which leads to a nonperturbative upper bound:

$$v_G(\phi_0) \geq v(\phi_0) \,, \tag{1.2}$$

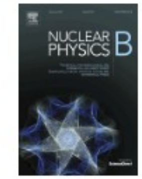
where $v(\phi_0)$ is the density corresponding to $V(\phi_0)$.

As a first step one requires the knowledge of free-field solutions of the scalar fields (and their corresponding vacuum states as trial states) in the variational approach followed.[7,3] This leads in Sec. III to a parameter-dependent bound on the regularized energy density. Its minimization gives $v_G(\phi_0)$.

The other definition of the effective potential is as a generator of all the proper Green's functions at zero external momenta. Based on this definition one can introduce renormalized masses and coupling constants as second-

ELSEVIER

Nuclear Physics B
Volume 371, Issues 1–2, 2 March 1992, Pages 353-414



Differential regularization and renormalization: a new method of calculation in quantum field theory ☆

Daniel Z. Freedman ✉, Kenneth Johnson ✉, JoséI. Latorre ✉

⊞ Show more

https://doi.org/10.1016/0550-3213(92)90240-C

Abstract

Most primitively divergent Feynman diagrams are well defined in x-space but too singular at short distances for transformation to p-space. A new method of regularization is developed in which singular functions are written as derivatives of less singular functions which contain a logarithmic mass scale. The Fourier transform is then defined by formal integration by parts. The procedure is extended to graphs with divergent subgraphs. No explicit cutoff or counter-terms are required, and the method automatically delivers renormalized amplitudes which satisfy Callan-Symanzik equations. These features are

THE C THEOREM

CERN-TH-6201/91
August 1991

RENORMALIZATION GROUP PATTERNS AND C-THEOREM IN MORE THAN TWO DIMENSIONS

Andrea CAPPELLI*, José Ignacio LATORRE**
Theory Division, CERN, Geneva, Switzerland

and

Xavier VILASÍS-CARDONA***
Departament d'Estructura i Constituents de la Matèria
University of Barcelona
Av. Diagonal 647, 08028 Barcelona, Spain

ABSTRACT

We elaborate on a previous attempt to prove the irreversibility of the renormalization group flow above two dimensions. This involves the construction of a monotonically decreasing c-function using a spectral representation. The missing step of the proof is a good definition of this function at the fixed points. We argue that for all kinds of perturbative flows the c-function is well-defined and the c-theorem holds in any dimension. We provide examples in multicritical and multicomponent scalar theories for dimension $2 < d < 4$. We also discuss the non-perturbative flows in the yet unsettled case of the $O(N)$ sigma-model for $2 \leq d \leq 4$ and large N.

CERN-TH-6201/91
August 1991

* On leave of absence from INFN, Sezione di Firenze, Italy. Bitnet: cappelli@cernvm.
** On leave of absence from Departament ECM, Barcelona. Bitnet: latorre@ebubecm1.
*** Bitnet: druida@ebubecm1.

THE C THEOREM

CERN-TH-6201/91
August 1991

RENORMALIZATION GROUP PATTERNS AND C-THEOREM IN MORE THAN TWO DIMENSIONS

Andrea CAPPELLI*, José Ignacio LATORRE**
Theory Division, CERN, Geneva, Switzerland

and

Xavier VILASÍS-CARDONA***
Departament d'Estructura i Constituents de la Matèria
University of Barcelona
Av. Diagonal 647, 08028 Barcelona, Spain

ABSTRACT

We elaborate on a previous attempt to prove the irreversibility of the renormalization group flow above two dimensions. This involves the construction of a monotonically decreasing c-function using a spectral representation. The missing step of the proof is a good definition of this function at the fixed points. We argue that for all kinds of perturbative flows the c-function is well-defined and the c-theorem holds in any dimension. We provide examples in multicritical and multicomponent scalar theories for dimension $2 < d < 4$. We also discuss the non-perturbative flows in the yet unsettled case of the $O(N)$ sigma-model for $2 \le d \le 4$ and large N.

CERN-TH-6201/91
August 1991

* On leave of absence from INFN, Sezione di Firenze, Italy. Bitnet: cappelli@cernvm.
** On leave of absence from Departament ECM, Barcelona. Bitnet: latorre@ebubecm1.
*** Bitnet: druida@ebubecm1.

arXiv

arXiv.org

Type of site	Science
Available in	English
Owner	Cornell University
Created by	Paul Ginsparg
Website	arxiv.org
Alexa rank	▲ 872 (As of 25 April 2019)[1]
Commercial	No
Launched	August 14, 1991; 27 years ago
Current status	Online
ISSN	2331-8422
OCLC number	228652809

THE EXACT RENORMALIZATION GROUP

CERN-TH.7482/94
UB-ECM-PF 94/32
McGill/94-54

SCHEME INDEPENDENCE
AND THE EXACT RENORMALIZATION GROUP *

Richard D. Ball,[a†] Peter E. Haagensen,[b] José I. Latorre,[c] and Enrique Moreno[c]

Theory Division, CERN,
CH-1211 Genève 23, Switzerland,[a]

Physics Department, McGill University
3600 University St., Montréal H3A 2T8, Canada, [b]

Departament d'Estructura i Constituents de la Matèria,
Facultat de Física, Universitat de Barcelona,
Diagonal 647, 08028 Barcelona, Spain.[c]

Abstract

We compute critical exponents in a Z_2 symmetric scalar field theory in three dimensions, using Wilson's exact renormalization group equations expanded in powers of derivatives. A nontrivial relation between these exponents is confirmed explicitly at the first two orders in the derivative expansion. At leading order all our results are cutoff independent, while at next-to-leading order they are not, and the determination of critical exponents becomes ambiguous. We discuss the possible ways in which this scheme ambiguity might be resolved.

November 1994

---

* This work is supported in part by funds provided by Grant AEN 90-0033 (Spain), and by the M.E.C. (Spain).

† On leave from a Royal Society University Research Fellowship.

[a] E-mail: `rball@surya11.cern.ch`

[b] E-mail: `haagense@cinelli.physics.mcgill.ca`

THE C THEOREM II

hep-th/9805015
UB-ECM-PF 98/12
DFTT 17/98

A PROOF OF THE IRREVERSIBILITY OF RENORMALIZATION GROUP FLOWS IN FOUR DIMENSIONS

Stefano Forte[a,c] and José I. Latorre[a,b]

[a] *Departament d'Estructura i Constituents de la Matèria, Universitat de Barcelona*
and
[b] *I.F.A.E., Diagonal 647, E-08028 Barcelona, Spain*

[c] *INFN, Sezione di Torino, Via P. Giuria 1, I-10125 Torino, Italy*

Abstract

We present a proof of the irreversibility of renormalization group flows, i.e. the c–theorem for unitary, renormalizable theories in four (or generally even) dimensions. Using Ward identities for scale transformations and spectral representation arguments, we show that the c–function based on the trace of the energy-momentum tensor (originally suggested by Cardy) decreases monotonically along renormalization group trajectories. At fixed points this c–function is stationary and coincides with the coefficient of the Euler density in the trace anomaly, while away from fixed points its decrease is due to the decoupling of positive–norm massive modes.

Submitted to: *Nuclear Physics B*

April 1998

ROMA 1999

18 months, 300 messages

ROMA 2002

hep-ph/0204232
GeF/TH/3-02
RM3-TH/02-01

Neural Network Parametrization of Deep–Inelastic Structure Functions

Stefano Forte[a], Lluís Garrido[b], José I. Latorre[b] and Andrea Piccione[c]

[a]INFN, Sezione di Roma Tre
Via della Vasca Navale 84, I-00146 Rome, Italy

[b]Departament d'Estructura i Constituents de la Matèria, Universitat de Barcelona,
Diagonal 647, E-08028 Barcelona, Spain

[c]INFN sezione di Genova and Dipartimento di Fisica, Università di Genova,
via Dodecaneso 33, I-16146 Genova, Italy

Abstract

We construct a parametrization of deep–inelastic structure functions which retains information on experimental errors and correlations, and which does not introduce any theoretical bias while interpolating between existing data points. We generate a Monte Carlo sample of pseudo–data configurations and we train an ensemble of neural networks on them. This effectively provides us with a probability measure in the space of structure functions, within the whole kinematic region where data are available. This measure can then be used to determine the value of the structure function, its error, point–to–point correlations and generally the value and uncertainty of any function of the structure function itself. We apply this technique to the determination of the structure function F_2 of the proton and deuteron, and a precision determination of the isotriplet combination F_2[p-d]. We discuss in detail these results, check their stability and accuracy, and make them available in various formats for applications.

April 2002

4 years, 800 messages

MILANO 2003

Wikipedia

WIKIPEDIA

The logo of Wikipedia, a globe featuring glyphs from several writing systems

Screenshot	[show]
Type of site	Online encyclopedia
Available in	303 languages
Owner	Wikimedia Foundation
Created by	Jimmy Wales, Larry Sanger[1]
Website	Official website
Alexa rank	— 5 (Global, February 2019)
Commercial	No
Registration	Optional[notes 1]
Users	>305,519 active users[notes 2] and >81,941,102 registered users 1,184 administrators (English)
Launched	January 15, 2001; 18 years ago
Current status	Active

NNPDF

- AI in physics
- Need for organization
- Structure of the collaboration
- Tools: wiki, email list and rules, repositories
- Day-to-day running: collaboration meetings, PC, rules
- Importance of spinoffs
- Importance of outreach

Short BIO

JIL got his PhD in Particle Physics at Univ. Barcelona. He was a Fullbright Fellow at MIT (USA) and a postdoc at the Niels Bohr Institute in Copenhagen. He then became associate professor at the Univ. Barcelona and, later, full professor in Theoretical Physics.

He has written over 100 papers on Particle Physics and Quantum Information and has directed 12 PhD thesis.

He was a founder of the Centro de Ciencias de Benasque Pedro Pascual.

He produced two documentaries, one of them on the last voice of the Manhattan Project.

He works on Ariticial Intelligence and was a founder of the NNPDF collaboration.

He is a partner at Entanglement Partners.

NNPDF IN GARGNANO (September 2018)