Carlo Danieli

10/02/2022

Scientic career

Condensed matter department, Max Planck Institute for the Physics of Complex Systems Dresden, Germany. Research fellow Dec. 2019 – Present Mentor: Professor Holger Kantz

Center for eoretical Physics of Complex Systems, Institute for Basic Science Daejeon, South Korea
Research fellow Feb. 2017 – Nov. 2019
Mentor: Professor Sergej Flach

Education

Center for eoretical Chemistry and Physics, New Zealand Institute for Advanced Studies, Massey University Auckland, New Zealand
PhD in Physics Feb. 2013 – Feb. 2017
Mentor: Professor Sergej Flach
CoMentor 1: Doctor Joshua D. Bodyfelt
CoMentor 2: Distinguished Professor Gaven J. Martin
esis: *Advances in Classical and antum wave Dynamics on asiperiodic Laices*

Padua University Padua, Italy
Master in Mathematics Oct. 2009 – Jun. 2012
Mentor: Professor Antonio Ponno
esis: *Energy Localization in DNA Models*

Padua University Padua, Italy
Bachelor in Mathematics Oct. 2006 – Oct. 2009
Mentor: Professor Professor Giancarlo Benein
esis: *e KAM eorem*

Recommenders

Professor Sergej Flach (Institute for Basic Science) sach@ibs.re.kr Professor Holger Kantz (Max Planck Institute) kantz@pks.mpg.de
Professor David K. Campbell (Boston University) dkcampbe@bu.edu

Visiting experiences

Erasmus Program at Humboldt Universitat zu Berlin¨ — Berlin, Germany
Two semesters — Fall 2010 – Summer 2011

Center for eoretical Physics of Complex Systems, Institute for Basic Science — Daejeon, South Korea
Visit 1: — June 2015 – August 2015
Visit 2: May 2016 – August 2016 Visit 3: January 2020 – February 2020

Teaching experience

Teaching assistant, Massey University — Fall 2015
Systems and Models in the Natural Sciences
Course held with Professor Sergej Flach,

Lab assistant, Massey University — Spring 2013 – Spring 2015
Physics lab supervisors — 5 semesters

Areas of expertise

- antum many-body dynamics
- Frustrated and macroscopically degenerate networks
- Many-body localization
- ermalization and chaos
- Discrete and compact breathers
- Interacting many body systems
- Ergodicity breaking phenomena
- Nonlinear dynamics
- Weakly non-integrable Hamiltonian systems
- Fano resonances
- Disordered and quasiperiodic laices
- Anderson localization
- Symplectic integration methods for classical non-integrable systems

Active collaborations

- Prof. Sergej Flach, Prof. Alexei Andreanov, and Mr. Ihor Vakulchyk (PCS-IBS, South Korea)
- Prof. David Campbell (Boston university, US)
- Prof. Rudo Roemer (Warwick university, UK) and Ms. Jie Liu (Xiangtan University, China)
- Prof. Zhigang Chen team (San Francisco State university and Nankai university)
- Prof. Charampolos Skokos, and mr. Bertin Many Manda (University of Cape Town, South Africa)
- Dr. Mithun udiyangal (University of Amherst Massachuses, US)
- Dr. Stefano Iubini (Institute for Complex Systems, Italy)

Computational skills

Fortran90, C++, Mathematica, Python

Referral activities

Physical Review X, Physical Review Leer, Physical Review B, Physical Review E, Europhysics Leers, Chaos, Physics Leers A, Journal of Nonlinear Science

Editorial activities

Guest editor of a Special Issue on Non-Ergodicity in dynamical systems for the journal *Chaos, Solitons and Fractals* jointly with Dr. Stefano Iubini (University of Padua), Dr. Mithun udiyangal (PCS-IBS), Prof. Antonio Politi (University of Aberdeen) and A.Prof. Wojciech De Roeck (Catholic University of Leuven)

Awards

- Best poster award at ”antization of dissipative chaos: ideas and means”, Physikzentrum, Bad Honnef, Germany (2019)
- Europhysics Leers, distinguished referee (2017)
- Best talk award at INMS Postgraduate Conference, Massey University, Auckland, New Zealand (2014)

Language Italian (native), English (procient), Korean (beginner)

Place: Dresden (Germany) Date:
10/02/2022

Signatory: Carlo Danieli Signature:

Full list of publications

Published

20. C. Danieli, A. Andreanov, and S. Flach
Many-body localization transition from atband ne-tuning
Phys. Rev. B Leers 105, L041113 (2022)

19. S. Xia, C. Danieli, Y. Zhang, X. Zhao, H. Lu, L. Tang, D. Li, D. Song, and Z. Chen
Higher-order exceptional point and Landau-Zener Bloch oscillations in driven non-Hermitian photonic Lieb laices APL Photonics 6,126106 (2021)

18. I. Vakulchyk, C. Danieli, A. Andreanov, and S. Flach
Heat percolation in many-body atband localizing systems Phys. Rev B 104, 144207 (2021)

17. C. Danieli, A. Andreanov, T. Mithun, and S. Flach
Nonlinear caging in All-Bands-Flat Laices
Phys. Rev B 104, 085131 (2021)

16. C. Danieli, A. Andreanov, T. Mithun, and S. Flach
antum Caging in Interacting Many-Body All-Bands-Flat Laices Phys. Rev B 104, 085132 (2021)

15. T. Mithun, C. Danieli, M.V. Fistul, B.L. Altshuler, and S.Flach

Fragile many body ergodicity from action diusion Phys. Rev. E 104, 014218 (2021)

14. C. Danieli, A. Andreanov, and S. Flach
Many-body at band localization
Phys. Rev. B 102, 041116(R) (2020)

13. C. Danieli, and T. Mithun
Casting dissipative compact states in coherent perfect absorbers
Phys. Rev. Research 2, 013054 (2020)

12. S. Xia, C. Danieli, W. Yan, D. Li, S. Xia, J. Ma, H. Lu, D. Song, L. Tang, S. Flach, and Z. Chen
Observation of quincunx-shaped and dipole-like at band states in photonic rhombic laices without band-touching
APL Photonics 5, 016107 (2020)

11. C. Danieli, B. Many Manda, T. Mithun, and Ch. Skokos
Computational eciency of numerical integration methods for the tangent dynamics of many-body Hamiltonian systems in one and two spatial dimensions
Math. in Eng. 1(3): 447-488, (2019)

10. C. Danieli, T. Mithun, Y. Kati, D.K. Campbell, and S. Flach
Dynamical glass in weakly non-integrable Klein-Gordon chains
Phys. Rev. E 100, 032217 (2019)

9. T. Mithun, C. Danieli, Y. Kati, S. Flach
Dynamical glass phase and ergodization times in Josephson junction chains
Phys. Rev. Le. 122, 054102 (2019)

8. T. Mithun, Y. Kati, C. Danieli, and S. Flach
Weakly nonergodic dynamics in the Gross-Pitaevskii laice
Phys. Rev. Le. 120, 184101 (2018)

7. C. Danieli, A. Maluckov, and S. Flach
Compact discrete breathers on at band networks Low Temperature Physics 44, 865 (2018)

6. C. Danieli, D.K. Campbell, and S. Flach
Intermient many-body dynamics and equilibrium Phys. Rev. E 95, 060202(R) (2017)

5. H. Hatami, C. Danieli, J.D. Bodyfelt, and S. Flach
asiperiodic driving of Anderson localized waves in one dimension
Phys. Rev. E 93, 062205 (2016)

4. C. Danieli, J.D. Bodyfelt, and S. Flach
Flat band engineering of mobility edges
Phys. Rev. B 91, 235134 (2015)

3. C. Danieli, K. Rayanov, B. Pavlov, G. Martin, and S.Flach
Approximating metal-insulator transitions
Int. J. of Mod. Phys. B 29, 1550036 (2015)

2. J.D. Bodyfelt, D. Leykam, C. Danieli, X. Yu, and S.Flach
Flat bands under correlated perturbations
Phys. Rev. Le. 113, 236403 (2014)

1. L. Morales-Molina, E. Doerner, C. Danieli, and S. Flach
Resonant metallic states in driven quasiperiodic laices: Aubry-Andre localization by design
Phys. Rev. A 90, 043630 (2014)

Book chapters

1. A. Ramachandran, C. Danieli, and S. Flach
Fano resonances in at band networks
Fano resonances in optics and microwaves, Springer series in optical sciences 219 (2018)

Submied

1. C. Danieli, and A. Andreanov
Compact breathers generator in one-dimensional nonlinear networks
arXiv:2104.11458 (2021)
Under consideration in Physical Review E

Unpublished

1. S. Flach, and C. Danieli
Comment on "Metal-insulator transition in an aperiodic ladder network: an exact result"
arXiv:1402.2742 (2014)

In preparation

1. C. Danieli, A. Andreanov, and S. Flach
Flatband netuning
Review paper in Nanophotonics

2. J. Liu, C. Danieli, J. Zhong and R.A. Roemer
Inverse Anderson transition in correlated three-dimensional Lieb laices

Miscellaneous

3. C. Danieli, T. Mithun, Y. Kati, and S. Flach
Freezing upon heating: the formation of dynamics glass
Press release for "Phys. Rev. Le. 122 054102 (2019)"

2. E. Hook, with the contribution of C. Danieli, and S. Flach
Breaking laws, making glass
Physics buzz issue for "Phys. Rev. Le. 120, 184101 (2018)"

1. C. Danieli, L. Diamante, and S. Flach
Breaking laws, making glass
Press release for "Phys. Rev. Le. 120, 184101 (2018)"

Place: Dresden (Germany) Date:
10/02/2022

Signatory: Carlo Danieli

Signature:

Selected contributions at international scientic events

Invited talks

5. American physical society, March meetings
Chicago, USA (2022)
- Talk title: *Finetuning localization in interacting atband networks*

4. IBS Conference on Flatbands: symmetries, disorder, interactions and thermalization
Center for eoretical Physics of Complex Systems, Daejeon, South Korea (2021)
- Talk title: *Finetuning localization in interacting atband networks*

3. Dynamics Days Asia Pacic Division
Singapore (Online format) (2020)
- Talk title: *ermalization of weakly non-integrable many-body systems*

2. American physical society, March meetings
Boston, USA (2019)
- Talk title: *e subtle road to equipartition - or not?*

1. International workshop on disordered systems: from localization to thermalization and topology
Center for eoretical Physics of Complex Systems, Daejeon, South Korea (2018)
- Talk title: *Dynamical glass*

Seminars

2. eoretical physics seminar at University of Warwick & Cergy University
Warwick, UK & Paris, France (Online format) (2020)
- Talk title: *From Single to Many Body Flatband Localization*

1. Center for eoretical Physics of Complex Systems, Daejeon, South Korea (2020)
- Talk title: *Caging interacting particles in at band networks*

Contributed talks

7. International workshop on recent advances in topological photonics
Center for eoretical Physics of Complex Systems, Daejeon, South Korea (2019)
- Talk title: *Compact breathers in nonlinear at band networks*

6. International workshop on ergodicity breaking in many body systems
International Institute of Physics, Natal, Brazil (2018)

- Talk title: *From intermient to glassy dynamics in weakly non-integrable hamiltonian systems*

5. Scientic gathering: Boris Chirikov, a pioneer of dynamical chaos
Centro Internacional de Ciencias, Cuernavaca, Mexico (2018)
- Talk 1 title: *Compact discrete breathers in at band networks*
- Talk 2 title: *Intermient equilibrium dynamics in many-body systems*

4. European physical society, March meetings
Berlin, Germany (2018)
- Talk title: *Weakly Non-Ergodic Dynamics in Many-Body Systems*

3. American physical society, March meetings
Los Angeles, USA (2018)
- Talk title: *Compact Discrete Breathers on Flat Band Networks*

2. International Symposium on Intrinsic Localized Modes: 30th Anniversary of Discovery - Kyoto, Japan (2018)
- Talk title: *Nonlinear compact periodic solutions in at band networks*

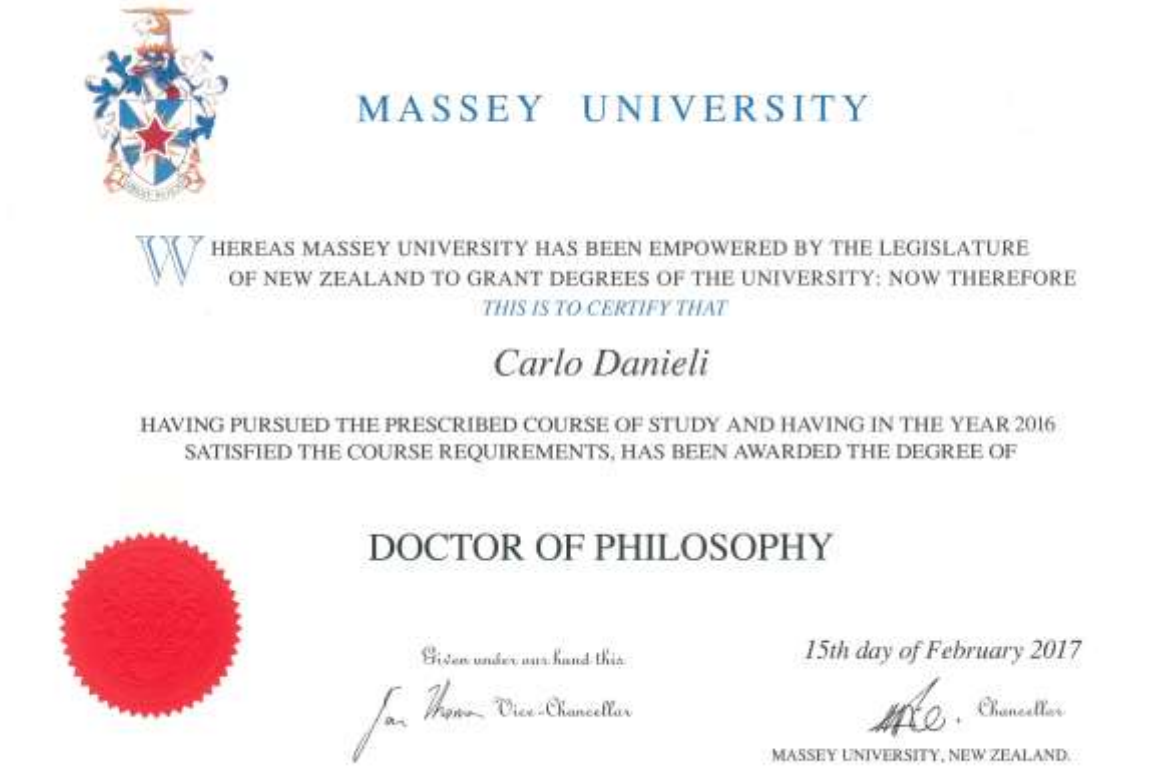
1. International workshop on discrete, nonlinear and disordered optics - Max Planck Institute for the Physics of Complex Systems Dresden, Germany (2017)
- Talk title: *asiperiodic driving of Anderson localized waves in one dimension* - Poster title: *at band engineering of mobility edges*

Place: Dresden (Germany) Date:
10/02/2022

Signatory: Carlo Danieli

Signature:

PhD certicate



MASSEY UNIVERSITY

WHEREAS MASSEY UNIVERSITY HAS BEEN EMPOWERED BY THE LEGISLATURE OF NEW ZEALAND TO GRANT DEGREES OF THE UNIVERSITY: NOW THEREFORE

THIS IS TO CERTIFY THAT

Carlo Danieli

HAVING PURSUED THE PRESCRIBED COURSE OF STUDY AND HAVING IN THE YEAR 2016 SATISFIED THE COURSE REQUIREMENTS, HAS BEEN AWARDED THE DEGREE OF

DOCTOR OF PHILOSOPHY

Given under our hand this *15th day of February 2017*

Vice-Chancellor

Chancellor

MASSEY UNIVERSITY, NEW ZEALAND.

Place: Dresden (Germany) Date:
10/02/2022

Signatory: Carlo Danieli

Signature:

Certicato di laurea magistrale

UNIVERSITÀ DEGLI STUDI DI PADOVA
DIPARTIMENTO DI MATEMATICA

CORSO DI STUDI IN MATEMATICA

Attestato di Laurea

Si attesta che il giorno 29 giugno 2012 lo/~~la~~ studente/~~ssa~~ **DANIELI CARLO** ha sostenuto l'esame finale del Corso di Laurea Magistrale in Matematica.

In base ai poteri conferiti a questa Commissione dal Magnifico Rettore gli/~~le~~ viene conferito il Titolo di **Dottore Magistrale in Matematica** con la votazione di 107 su 110

Padova, 05 luglio 2012

Il Presidente della Commissione di Laurea
Alberto Facchini

I Componenti della Commissione di Laurea

Place: Dresden (Germany) Date:
10/02/2022

Signatory: Carlo Danieli

Signature:

Lista esami sostenuti durante la laurea magistrale

UNIVERSITÀ DEGLI STUDI DI PADOVA

AREA DIDATTICA E SERVIZI AGLI STUDENTI
SERVIZIO SEGRETERIE STUDENTI

Matricola 623230

N. Certif.
2011536691/CT/T_ESA

Si certifica che DANIELI CARLO , nato a Schio (VI) il 25/07/1987 , ha conseguito la Laurea Magistrale in MATEMATICA , LM-40 - Classe delle lauree magistrali in Matematica secondo il D.M. 16 marzo 2007 , presso questa Università degli Studi in data 05/07/2012 con voto 107/110.

Ai sensi del D.M. 270/2004 compete la qualifica accademica di Dottore magistrale.

La durata normale del suddetto corso di studio è di due anni .

Si certifica inoltre che lo studente ha sostenuto i seguenti esami ai fini del conseguimento del titolo:

Descrizione	Data	Esito	Valore	SSD	Tipo esame
TEORIA DELLE FUNZIONI 1	08/01/2010	30/30	6	MAT/05	
FUNZIONI DI PIU' VARIABILI COMPLESSE	29/01/2010	27/30	4	MAT/05	
ANALISI ARMONICA	08/07/2010	30/30	6	MAT/05	
MECCANICA HAMILTONIANA	16/07/2010	30/30 L	6	MAT/07	
MECCANICA SUPERIORE	22/07/2010	28/30	6	MAT/07	
ANALISI NUMERICA	26/07/2010	27/30	6	MAT/08	
PARTIELLE DIFFERENTIALGLEICHUNGEN DER PHYSIK	03/03/2011	28/30	4		RA
HOEHERE ANALYSIS // FUNKTIONSANALYSIS	03/03/2011	24/30	10		RA
STOCHASTIK II	21/03/2011	21/30	10		RA
HOEHERE ANALYSIS II	15/07/2011	29/30	10		RA
SEMINARIO	28/07/2011	Approvato	4		RA
EINFUEHRUNG IN DIE SPEKTRALTHEORIE VON DIFFERENTIALOPERATOREN	31/08/2011	26/30	10		RA
MODELLI FISICO-MATEMATICI	31/01/2012	30/30	6	MAT/07	
PROVA FINALE	05/07/2012	Idoneo	36	PROFIN_S	
		Totale CFU	**124.00**		

La media è di 27.024.

Si certifica inoltre che lo studente non ha sostenuto esami non valutati ai fini del conseguimento del titolo.

Il presente certificato è rilasciato in carta resa legale.

Copia del presente certificato, rilasciato in originale, viene conservata negli archivi elettronici dell'Università

UNIVERSITÀ DEGLI STUDI DI PADOVA

AREA DIDATTICA E SERVIZI AGLI STUDENTI
SERVIZIO SEGRETERIE STUDENTI

Matricola 623230

N. Certif.
2011536691/CTIT_ESA

Ai sensi dell'art. 40, D.P.R. 28 dicembre 2000, n. 445, il presente certificato è rilasciato solo per l'estero

LEGENDA
Valore: Annualità o Crediti Formativi Universitari
SSD: Settore Scientifico Disciplinare
Tipo esame: CA - Attività convalidata
CF - Frequenza convalidata
RA - Attività riconosciuta
RF - Frequenza riconosciuta

Padova, 30/08/2012

Il Capo Servizio
Dott.ssa Sigolo

Div. Segreterie Studenti
BERTO Dott. Annamaria

UNIVERSITA' DEGLI STUDI DI PADOVA
La firma che precede è stata apposta da BERTO
ANNAMARIA dipendente dell'Università degli Studi di Padova assegnata/o al Servizio Segreterie Studenti e resa davanti a me presso la Prefettura di Padova per la finalità di cui all'art. 38, comma 1 del D.P.R. n. 445/2000.
Padova, 30.8.12
Div. Segreterie Studenti
BERTO Dott. Annamaria

Div. Segreterie Studenti
BERTO Dott. Annamaria

Copia del presente certificato, rilasciato in originale, viene conservata negli archivi elettronici dell'Università

Pagina 2 di 2

Place: Dresden (Germany) Date:
10/02/2022

Signatory: Carlo Danieli

Signature:

Autorizzazione al trattamento dei dati personali

DICHIARAZIONE

Autorizzo il traamento dei miei dati personali presenti nel cv ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 “Codice in materia di protezione dei dati personali” e dell’art. 13 del GDPR (Regolamento UE 2016/679).

IL DICHIARANTE

Carlo Danieli 

Place: Dresden (Germany) Date:
10/02/2022

Signatory: Carlo Danieli Signature: