UNIVERSITÀ DEGLI STUDI DI MILANO

TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO   **ID CODE 4944**

I the undersigned ask to participate in the public selection, for qualifications and examinations, for the awarding of a type B post-doc fellowship at **Dipartimento di Matematica «Federigo Enriques».**

Scientist-in-charge: Prof. **Marco Adamo Seveso**

Luca Dall'Ava

CURRICULUM VITAE

PERSONAL INFORMATION

Surname	Dall'Ava
Name	Luca
Date of birth	03/05/1993

PRESENT OCCUPATION

Appointment	Structure
Ph.D. Fellow	University of Duisburg-Essen, Fakultät für Mathematik, Essen.

EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Master	Matematica (classe LM-40 - Matematica): ALGANT Master	Università degli studi di Milano	2017
Master	Master of Science - Mathematics: ALGANT Master	University of Duisburg-Essen	2017

FOREIGN LANGUAGES

Languages	Level of knowledge
Italian	Mother Tongue
English	Proficient User (C1)
German	Intermediate User (B1/B2)
French	Intermediate User (B1)

AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description of award

2017	Ph.D. Fellowship - University Duisburg–Essen. Supervisor: Prof. Dr. Massimo Bertolini (3+1 year renewal).
2016	Scholarship (Stipendienprogramm Fakultät für Mathematik) - University of Duisburg-Essen.
2016	Erasmus Mundus Scholarship - Università degli Studi di Milano.
2016	Travel grant - University of Duisburg-Essen
2012	Scholarships provided by Fondazione Girola o.n.l.u.s., Piazza Castello n. 26, 20121, Milano. (4 years)

TRAINING OR RESEARCH ACTIVITY

My research interests lie in the arithmetic of quaternion algebras and its relation with the arithmetic of elliptic curves and modular forms. In particular, special values and the behavior of p-adic and complex L-functions at critical points. I am also interested in computational approaches to the study of these number-theoretic questions.

In my Ph.D. thesis, I investigate the p-adic triple product L-function defined by Hsieh in the so-called balanced region. More precisely, the second section of my dissertation deals with the problem of explicitly approximating the value of this p-adic L-function at the limit point $(2,1,1)$. Building on the work of Franc and Masdeu, I consider finite length geodesics on the Bruhat-Tits tree for $GL(2,\mathbb{Q}_p)$ and provide an algorithmic procedure for approximating the value at $(2,1,1)$, when at least one of the Hida families considered is associated with an elliptic curve over the rationals.

A careful analysis of the above p-adic L-function shows how it is not possible to consider classical weight-one modular forms in the limit process described; the main issue is that one can only consider Hida families with tame levels divided exactly by the discriminant of the definite quaternion algebra associated with the triple of families. This problem leads to an interesting new situation, namely the study of quaternionic Hida families associated with the so-called special orders defined by Pizer and Hijikata-Pizer-Shemanske. These orders are a generalization of the well-known Eichler orders which allow the study of more general automorphic forms on the quaternion algebra. Automorphic forms with Eichler level structure correspond, via the Jacquet-Langlands-Shimizu correspondence, to classical modular newforms with the level divided exactly by the reduced discriminant of the quaternion algebra. On the contrary, special orders allow higher ramification at the primes dividing the discriminant. The works of Hijikata, Pizer, and Shemanske prove that the higher ramification may produce a multiplicity-2 phenomenon: each classical twist-minimal modular newform lifts to two linearly independent quaternionic modular forms. The first section of my thesis deals with the just described situation studying the behavior of quaternionic Hida families with special level structure. Although only quaternion algebras over the rationals are considered, I generalize the approach of Longo-Vigni to this situation and I prove an analogous control theorem in the spirit of Hida. The novelty lies in the rank of the interpolation module satisfying the control theorem; contrary to the case of Eichler orders, in which this module has rank 1, it attains rank 2, reflecting the multiplicity at each specialization.

(A preliminary version of my thesis can be found at https://sites.google.com/view/luca-dallava/home-page)

CONGRESSES AND SEMINARS

Date	Title	Place
19-21/05/2021	Conference: "Rendez-vous on Special Values and Periods".	Online (École normale supérieure de Lyon, Lyon, France)
26-30/04/2021	School: "Spring School towards a mod p Langlands correspondence".	Online (University of Duisburg-Essen, Essen, Germany)

2/02/2021	Talk: "Proof of Theorem B". ESAGA-Research Seminar: "p-adic Jacquet-Langlands correspondence". (On the paper "The p-adic Jacquet-Langlands correspondence and a question of Serre" by S. Howe).	University of Duisburg-Essen, Essen, Germany.
14/12/2020	Conference: "Luxembourg Number Theory Day 2020".	Online (Université du Luxembourg, Luxembourg)
2/7/2020	Talk: "Reflection-type theorems for Iwasawa modules". ESAGA-Research Seminar: "Higher Chern classes in Iwasawa theory". (On the paper "Higher Chern classes in Iwasawa theory" Bleher, Chinburg, Greenberg, Kakde, Pappas, Sharifi, and Taylor).	University of Duisburg-Essen, Essen, Germany.
17/6/2020	Talk: "Beilinson's conjectures". ESAGA-Seminar course: "Higher Chern classes in Iwasawa theory". (On the survey "Beilinson's conjectures" by Jan Nekovář).	University of Duisburg-Essen, Essen, Germany.
26/11/2019	Expository talk: "A tale of (quaternionic) modular forms". Invited speaker for the London Junior Number Theory seminar.	King's College London, London, UK.
15-19/7/2019	Conference: "Recent advances in the arithmetic of Galois representations".	Università degli Studi di Genova, Genova, Italy.
03/7/2019	Talk: "Application". ESAGA-Seminar course: "Seminar on p-adic geometry and rigid cohomology". (On the notes "Point counting after Kedlaya" by Bas Edixhoven).	University of Duisburg-Essen, Essen, Germany.
11-4/6/2019	Conference: "Geometry and Arithmetic of Algebraic Varieties". Final conference of the SFB/TRR45 Bonn/Essen/Mainz.	University of Bonn, Bonn, Germany.
20-24/5/2019	Conference: "p-adic modular forms and p-adic L-functions".	(Università degli Studi di Milano) Como, Villa del Grumello, Italy.
01/2019	Talk: "Steven's control theorem". ESAGA-Seminar course: "Overconvergent modular symbols". (On the course notes "Eigenvarieties, families of Galois representations, p-adic L-functions" by Joël Bellaïche).	University of Duisburg-Essen, Essen, Germany.
1-5/10/2018	Conference: "Conference on Arithmetic Algebraic Geometry, On the occasion of Michael Rapoport's 70th birthday".	Hausdorff Center for Mathematics, Bonn, Germany.
17-21/09/2018	School: "School in Arithmetic Geometry".	University of Duisburg-Essen, Essen, Germany.
07/2018	Talk: "Hida families construction". ESAGA-Seminar course: "Seminar on Hida theory". (On the paper "On ordinary λ-adic representations associated to modular forms" by Andrew Wiles).	University of Duisburg-Essen, Essen, Germany.
9-13/04/2018	Conference: "Arithmetic and Analysis, A conference on the occasion of Christopher Deninger's 60th birthday".	University of Münster, Münster, Germany.

| 3-7/03/2018 | School: "Arizona Winter School 2018: Iwasawa Theory". | University of Arizona, Tucson, AZ (USA). |
| 27/8-6/9/2017 | School: "Summer School on Modular Forms". | Università degli Studi di Padova, Padova, Italy. |

TEACHING

Year	Activity
2021	Teaching assistant for the Master course "Modular forms 2" at University of Duisburg-Essen. Lecturer: Dr. J. Lin.
2020	Teaching assistant for the Master course "Modular forms 1" at University of Duisburg-Essen. Lecturer: Dr. J. Lin.
2018	Teaching assistant for the Master course "Modular forms 1" at University of Duisburg-Essen. Lecturer: Dr. R. Venerucci.

OTHER INFORMATION

PhD: The expected date of my PhD in Mathematics at University of Duisburg-Essen is September 2021.

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Place and date: Essen (Germany), 21/06/2021.

SIGNATURE