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Seminarium SFARA

Grothendieck's fundamental group

B1-37(?), Tuesday, 10.30 - 12.00
Speakers: B.Biadasiewicz, A.Espinosa, W.Gajda, J.Garnek,
K.Górnisiewicz, A.Kaim-Garnek, Ł.Michalak i B.Naskręcki.

This semester our seminar will focus at the definition and basic properties of the etale fundamental group defined by Grothendieck, which is one of central objects of study in arithmetic geometry. In a sense the seminar is a natural (algebraic) continuation of the graduate course *Covering spaces in algebra and geometry* taught by me at the WMI UAM last semester. We will mainly base our lectures on Tamas Szamuely's book *Galois groups and fundamental groups*, or more precisely on its last three chapters. Additional literature on the subject is listed at the end of the file. Speakers are kindly asked to discuss with me, before preparing their lectures: all covered material, proofs, necessary omissions etc.

cc. *Wojciech Gajda*

Lecture 1. Sections: [4.2], [4.3]

> **the 29th of October**, *lecturer: Bartosz Biadasiewicz.*

Lecture 2. Sections: [4.4], [4.5]

> **5.11**, *lecturer: Łukasz Michalak.*

Lecture 3. Sections: [4.6], [4.7]

> **12.11**, *lecturer: Artur Espinosa.*

Lecture 4. Section: [5.1]

> **19.11**, *lecturer: Aleksandra Kaim-Garnek.*

Lecture 5. Section: [5.2]

> **26.11**, *lecturer: Jędrzej Garnek and Bartosz Biadasiewicz.*

Lecture 6. Section: [5.3]

> **3.12**, *lecturer: Jędrzej Garnek and Łukasz Michalak.*

Lecture 7. Sections: [5.4], [5.5]

> **10.12**, *lecturer: Bartosz Naskręcki.*

Lecture 8. Sections: [5.6] and [5.7][1]

> **17.12**, *lecturer: Jędrzej Garnek.*

Lecture 9. Section: [5.8][1]

> **the 7th of January 2020**, *lecturer: Bartosz Naskręcki.*

Lecture 10. (Some category theory and Tanaka-Krein theorem)

> **Sections:** [6.1] - [6.4][1], **14.01**, *lecturer: Wojciech Gajda.*

Lectures 11 & **12.** (Neutral Tannakian categories and Nori's group scheme)

> **Sections:** [6.5] - [6.7][1], **21.01** & **28.01**, *lecturer: Wojciech Gajda.*

Literature[2]

- T.Szamuely, *Galois groups and fundamental groups*
- SGA 1
- A.Cadoret, *Galois Categories*
- J.P. Murre, *Lectures on an introduction to Grothendieck's theory of the fundamental group*
- J.Milne, *Etale cohomology*
- Stacks Project
- EGA IV4
- H.Lenstra, *Galois theory of schemes*
- L.Illusie, *Grothendieck's existence theorem in formal geometry* (in FGA Explained)
- M.Hadian, *Lectures on fundamental groups.*

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[1] *a bit more demanding material*

[2] All the listed items are available in the library of the WMI UAM, in the net or in the dropbox folder of SFARA.