Galos categories (J. Stix)

Expected pre-requisites for J. Stix’s lectures:

- knowing the topological fundamental group (as a motivation)
- pro-finite groups, absolute Galois groups
- etale maps

A. Grothendieck et al

The ‘bible’ on Galois categories; it is very rewarding to read and a must for anyone interested in the details. But it’s not a survey though...

J.P. Murre

Lecture notes from a series of lectures given by J.P. Murre at the Tata Institute in 1964-65. It is much shorter and accessible than the SGA 1.

J.B. Bost et al

Proceedings volume of a series of conferences given at CIRM in 1998. It consists of survey articles introducing both classical and more recent results on the étale fundamental group of curves.

T. Szamuely

A pleasant introduction to both Galois and Tannakian categories. It follows a pedestrian path, starting with familiar examples of fundamental groups in number theory and topology before turning progressively - through the enlightening examples of Riemann surfaces and algebraic curves - to the general Grothendieck formalism.

A. Cadoret

Lecture notes from a Master 2 course given at Bordeaux University during the spring of 2010. It is close in spirit to the notes of J.P. Murre.

Other lecture notes are available online, in particular,
- Tag 0BQ6 of the Stack Project
- H.W Lenstra’s lecture notes ‘Galois theory for schemes’:
  
Tannakian categories (F. Ivorra)

N. Saavedra Rivano

The reference book on Tannakian categories but quite monumental too. The following two papers are shorter classical surveys on the subject.

P. Deligne and J.S. Milne

P. Deligne

Y. André
*Une introduction aux motifs (motifs purs, motifs mixtes, périodes)*, Panorama et synthèse 17, S.M.F. 2004.

An ambitious and bright panoramic survey of the theories of motives.

Mixed motives (J. Ayoub):

C. Mazza, V. Voevodsky and C. Weibel

This is a very readable book on mixed motives and motivic cohomology that contains most of the results of the original reference (which is much harder to read):

V. Voevodsky, A. Suslin and E. M. Friedlander

J. Ayoub

This is the paper where the motivic Hopf algebra and the motivic Galois group are constructed using Voevodsky’s motives.

J. Ayoub

This paper develops an application of motives and the motivic Galois group to periods in families. An overview of the relation between motives and periods can be found in:
J. Ayoub

Y. André
*Groupes de Galois motiviques et périodes* Séminaire Bourbaki, exposé 1104, 2015.

**Anabelian geometry (Y. Hoshi)**

A. Grothendieck
*Esquisse d’un programme* (With an English translation on p. 243–283),

A. Grothendieck
*Brief an G. Faltings* (With an English translation on pp. 285–293),

F. Pop
*Glimpses of Grothendieck’s anabelian geometry*,

H. Nakamura
*Galois rigidity of profinite fundamental groups*

G. Faltings
*Curves and their fundamental groups (following Grothendieck, Tamagawa and Mochizuki)*

H. Nakamura, A. Tamagawa, and S. Mochizuki
*The Grothendieck conjecture on the fundamental groups of algebraic curves*

J. Neukirch, A. Schmidt, and K. Wingberg

M. Saïdi and A. Tamagawa
*On the anabelian geometry of hyperbolic curves over finite fields*

F. Bogomolov and Y. Tschinkel
*Introduction to birational anabelian geometry*
Chtoucas for reductive groups and the geometric Langlands conjecture (S. Morel)

You can find V. Lafforgue’s paper on his webpage or on the arXiv.

V. LAFFORGUE
Chtoucas pour les groupes réductifs et paramétrisation de Langlands globale, preprint.

as well as the introductory versions (both in French and in English):

V. LAFFORGUE
Introduction aux chtoucas pour les groupes réductifs et la paramétrisation de Langlands globale, preprint.
Introduction to chtoucas for reductive groups and to the global Langlands parameterization, preprint.

There is also also a Bourbaki seminar on the topics:

B. STROH
La paramétrisation de Langlands globale sur les corps de fonctions, d’après Vincent Lafforgue, Séminaire Bourbaki, exposé 1110, 2016.

The notes of S. Morel’s Princeton lectures are temporarily downloadable on the webpage of the conference.

Eventually, for tools involved in V. Lafforgue’s proof, you can also browse:

- (Construction and study of moduli spaces of chtoucas)

- (More elementary stuff about stacks, $G$-bundles etc.) the notes of Gaitsgory’s students seminar
  http://www.math.harvard.edu/~gaitsgde/grad_2009/

- (Geometric Satake)
  T. Richarz

D. Gaitsgory
Chabauty-Kim method (S. Wewers):

M. Kim *The motivic fundamental group of \( \mathbb{P}^1 \setminus \{0, 1, \infty\} \) and the theorem of Siegel*, Invent. Math. 161, p. 629–656, 2005.

Kim’s seminal paper

M. Hadian-Jazi


Variations around Kim’s method. Probably more accessible than Kim’s paper

V. Mc Callum and B. Poonen


An introduction to the \( p \)-adic method of Chabauty and Coleman to try and determine explicitly the set of rational points on a genus \( \geq 2 \) projective curve over a number field. Kim’s method can be regarded as a wide non-abelian generalization of these ideas.

In case it may help, on


you can find a synopsis for a working group on Kim’s method.