Short Curriculum Vitae
Ignasi Sau Valls

March 29, 2023
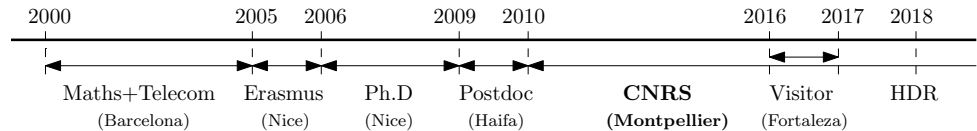

Personal Information

Date/place of birth: May 14, 1982 / Barcelona, Catalonia
E-mail: ignasi.sau@lirmm.fr
Homepage: www.lirmm.fr/~sau
Position (since 2010): CR CNRS (HDR in 2018), LIRMM, Montpellier, FR

2000	2005	2006	2009	2010	2016	2017	2018
Maths+Telecom (Barcelona)	Erasmus (Nice)	Ph.D (Nice)	Postdoc (Haifa)	**CNRS** (Montpellier)	Visitor (Fortaleza)		HDR

Summary of the most relevant activities in the period 2019-2023

Before proceeding to detailed information in the next four pages of this short CV, in this section I summarize those that are, in my opinion, my most relevant achievements **restricted to the reference period 2019-2023**:

- **Publications**:
  - **28** articles published in **international journals**, such as JCTB (1), TALG (1), SIDMA (3), or Algorithmica (8).
  - **12** articles published in **international conferences**. In particular, in **2020** I published one article in **SODA** (the best conference in the world on discrete algorithms) and **2** articles in **ICALP** (the best European conference on theoretical computer science). NB: I give priority to journal publications.

- **Projects**: **PI** of **ANR JCJC** project ELiT (ANR-20-CE48-0008-01), funded **168.924€**, 10/2021-09/2025.

- **Organization of international conferences**:
  - June 2019: **co-chair and main organizer** of **WG** (45th International Workshop on Graph-Theoretic Concepts in Computer Science), 50 participants, Vall de Núria, Catalonia.
  - July 2022: **chair and main organizer** of **ICGT** (11th International Colloquium on Graph Theory and Combinatorics), 150 participants, Montpellier, France. *This conference holds every 4 or 5 years.*

- **Student supervision**: **3 Ph.D** students, **2** long **Ph.D internships** of students from Brazil, **2 M2** internships.

- **Invited talks and courses at conferences**:
  - Latin and American Algorithms, Graphs and Optimization Symposium (LAGOS), 2019, Brazil.
  - Haifa Workshop on Graph Theory, Combinatorics and Algorithms, 2020, Israel (online).
  - Summer school of GT Graphes SGT (School of Graph Theory), 2022, Murol, France. *Course of 6h.*
  - International Conference on Algorithms and Discrete Applied Mathematics (CALDAM), 2023, Gandhinagar, India.
  - 36th Escuela de Ciencias Informáticas (ECI), Buenos Aires, Argentina, 2023. *Course of 15h.*

- **Committees**:
  - **Editor** of the Discrete Algorithms section of the journal *Discrete Mathematics & Theoretical Computer Science* (DMTCS) since July 2018.
  - **Editor** of the journal *Information and Computation* (I&C) since September 2021.
  - **Program Committee member** of the conferences MFCS'19, WG'19, IPEC'21, WG'22, ICGT'22, AlgoTel'23.
  - **Steering Committee member** of WG (International Workshop on Graph-Theoretic Concepts in Computer Science) since June 2019.
  - **Reviewer** and committee member of **5 Ph.D theses**: in **France (2)**, **Brazil (2)**, and **Germany (1)**.

- **Other administrative duties**:
  - Member of the "**Commission of Section 27 (MIPS)**" of Université de Montpellier since June 2017.

Publications in the period 2019-2023

International journals in the period 2019-2023 (without taking into account submitted articles)

[J1] V. Garnero, C. Paul, I. Sau, and D. M. Thilikos. Explicit Linear Kernels for Packing Problems. *Algorithmica*, *81(4): 1615-1656*, **2019**.

[J2] J. Baste, D. Rautenbach, and I. Sau. Upper Bounds on the Uniquely Restricted Chromatic Index. *Journal of Graph Theory (**JGT**), 91(3): 251-258*, **2019**.

[J3] J. Araújo, C. Linhares Sales, I. Sau, and A. Silva. Weighted proper orientations of trees and graphs of bounded treewidth. *Theoretical Computer Science (**TCS**), 771: 39-48*, **2019**.

[J4] J. de O. Bastos, F. S. Benevides, G. O. Mota, and I. Sau. Counting Gallai 3-colorings of complete graphs. *Discrete Mathematics (**DM**), 342(9): 2618-263*, **2019**.

[J5] J. Baste, D. Rautenbach, and I. Sau. Approximating Maximum Uniquely Restricted Matchings in Bipartite Graphs. *Discrete Applied Mathematics (**DAM**), 267: 30-40*, **2019**.

[J6] M. Bougeret and I. Sau. How much does a treedepth modulator help to obtain polynomial kernels beyond sparse graphs? *Algorithmica*, *81(10): 4043-4068*, **2019**.

[J7] J. Baste, I. Sau, and D. M. Thilikos. Hitting minors on bounded treewidth graphs. I. General upper bounds. *SIAM Journal on Discrete Mathematics (**SIDMA**), 34(3), 1623-1648*, **2020**.

[J8] J. Baste, I. Sau, and D. M. Thilikos. Hitting minors on bounded treewidth graphs. II. Single-exponential algorithms. *Theoretical Computer Science (**TCS**), 814: 135-152*, **2020**.

[J9] J. Baste, I. Sau, and D. M. Thilikos. Hitting minors on bounded treewidth graphs. III. Lower bounds. *Journal of Computer and System Sciences (**JCSS**), 109: 56-77*, **2020**.

[J10] J. Baste, D. Gözüpek, C. Paul, I. Sau, M. Shalom, and D. M. Thilikos. Parameterized complexity of finding a spanning tree with minimum reload cost diameter. *Networks, 75(3): 259-277*, **2020**.

[J11] J. Araújo, V. A. Campos, A. K. Maia, I. Sau, and A. Silva. On the complexity of finding internally vertex-disjoint long directed paths. *Algorithmica, 82(6): 1616-1639*, **2020**.

[J12] J. Araújo, V. A. Campos, C. V. G. C. Lima, V. F. dos Santos, I. Sau, and A. Silva. Dual parameterization of Weighted Coloring. *Algorithmica, 82(8), 2316-2336*, **2020**.

[J13] L. Faria, S. Klein, I. Sau, U. S. Souza, and R. Sucupira. Maximum cuts in edge-colored graphs. *Discrete Applied Mathematics (**DAM**), 281: 229-234*, **2020**.

[J14] G. C. M. Gomes and I. Sau. Finding cuts of bounded degree: complexity, FPT and exact algorithms, and kernelization. *Algorithmica, 83(6): 1677-1706*, **2021**.

[J15] P. T. Lima, V. F. dos Santos, I. Sau, and U. S. Souza. Reducing graph transversals via edge contractions. *Journal of Computer and System Sciences (**JCSS**), 120: 62-74*, **2021**.

[J16] L. A. C. Viana, M. Campêlo, I. Sau, and A. Silva. A Unifying Model for Locally Constrained Spanning Tree Problems. *Journal of Combinatorial Optimization (**JOCO**), 42(1): 125-150*, **2021**.

[J17] R. Belmonte and I. Sau. On the complexity of finding large odd induced subgraphs and odd colorings. *Algorithmica, 83(8): 2351-2373*, **2021**.

[J18] V. A. Campos, G. C. M. Gomes, A. Ibiapina, R. Lopes, I. Sau, and A. Silva. Coloring problems on bipartite graphs of small diameter. *Electronic Journal of Combinatorics (**E-JC**), 28(2): P2.14*, **2021**.

[J19] I. Sau and U. S. Souza. Hitting forbidden induced subgraphs on bounded treewidth graphs. *Information and Computation (**I&C**), 281: 104812*, **2021**.

[J20] R. Lopes and I. Sau. A relaxation of the Directed Disjoint Paths problem: a global congestion metric helps. *Theoretical Computer Science (**TCS**), 898: 75-91*, **2022**.

[J21] I. Sau, G. Stamoulis, and D. M. Thilikos. k-apices of minor-closed graph classes. II. Parameterized algorithms. *ACM Transactions on Algorithms (**TALG**), 18(3): 21, pp 1–30*, **2022**.

[J22] J. Araújo, M. Bougeret, V. A. Campos, and I. Sau. Introducing lop-kernels: a framework for kernelization lower bounds. *Algorithmica, 84(11): 3365–3406*, **2022**.

[J23] M. Bougeret, B. M. P. Jansen, and I. Sau. Bridge-depth characterizes which minor-closed structural parameterizations of Vertex Cover admit a polynomial kernel. *SIAM Journal on Discrete Mathematics (**SIDMA**), 36(401): 2737–2773*, **2022**.

[J24] V. A. Campos, R. Lopes, A. K. Maia, and I. Sau. Adapting the Directed Grid Theorem into an FPT algorithm. *SIAM Journal on Discrete Mathematics (**SIDMA**), 36(3): 1887-1917*, 2022.

[J25] J. Araújo, M. Bougeret, V. A. Campos, and I. Sau. On the complexity of computing maximum minimal blocking and hitting sets. *Algorithmica, 85(2): 444–491, 2023*.

[J26] I. Sau, G. Stamoulis, and D. M. Thilikos. *k*-apices of minor-closed graph classes. I. Bounding the obstructions. *Journal of Combinatorial Theory, Series B (JCTB), 161: 180–227, 2023*.

[J27] P. T. Lima, V. F. dos Santos, I. Sau, U. S. Souza and P. Tale. Reducing the vertex cover number via edge contractions. Accepted in *Journal of Computer and System Sciences (JCSS)*.

[J28] Target set selection with maximum activation time. L. Keiler, C. V. G. C. Lima, A. K. Maia, R. Sampaio, and I. Sau. Accepted (very minor revision already submitted) in *Discrete Applied Mathematics (DAM)*.

International conferences in the period 2019-2023 (without taking into account submitted articles)

[C1] V. A. Campos, R. Lopes, A. K. Maia, and I. Sau. Adapting the Directed Grid Theorem into an FPT Algorithm. *In Proc. of the X Latin and American Algorithms, Graphs and Optimization Symposium (LAGOS), volume 346 of ENTCS, pages 229-240, Belo Horizonte, Brazil, June 2019*.

[C2] G. C. M. Gomes and I. Sau. Finding cuts of bounded degree: complexity, FPT and exact algorithms, and kernelization. *In Proc. of the 14th International Symposium on Parameterized and Exact Computation (IPEC), volume 148 of LIPIcs, pages 19:1–19:15, Munich, Germany, September 2019*.

[C3] J. Baste, I. Sau, and D. M. Thilikos. A complexity dichotomy for hitting connected minors on bounded treewidth graphs: the chair and the banner draw the boundary. *In Proc. of the 31st Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), pages 951–970, Salt Lake City, Utah, U.S., January 2020*.

[C4] M. Bougeret, B. M. P. Jansen, and I. Sau. Bridge-Depth Characterizes which Structural Parameterizations of Vertex Cover Admit a Polynomial Kernel. *In Proc. of the 47th International Colloquium on Automata, Languages and Programming (ICALP), volume 168 of LIPIcs, pages 16:1-16:19, held online, July 2020*.

[C5] I. Sau, G. Stamoulis, and D. M. Thilikos. An FPT-algorithm for recognizing *k*-apices of minor-closed graph classes. *In Proc. of the 47th International Colloquium on Automata, Languages and Programming (ICALP), volume 168 of LIPIcs, pages 95:1-95:20, held online, July 2020*.

[C6] R. Belmonte and I. Sau. On the complexity of finding large odd induced subgraphs and odd colorings. *In Proc. of the 46th International Workshop on Graph-Theoretic Concepts in Computer Science (WG), volume 12301 of LNCS, pages 67–79, held online, June 2020*.

[C7] R. Lopes and I. Sau. A relaxation of the Directed Disjoint Paths problem: a global congestion metric helps. *In Proc. of the 45th International Symposium on Mathematical Foundations of Computer Science (MFCS), volume 170 of LIPIcs, pages 68:1-68:15, held online, August 2020*.

[C8] I. Sau and U. S. Souza. Hitting forbidden induced subgraphs on bounded treewidth graphs. *In Proc. of the 45th International Symposium on Mathematical Foundations of Computer Science (MFCS), volume 170 of LIPIcs, pages 82:1-82:15, held online, August 2020*.

[C9] P. T. Lima, V. F. dos Santos, I. Sau, and U. S. Souza. Reducing graph transversals via edge contractions. *In Proc. of the 45th International Symposium on Mathematical Foundations of Computer Science (MFCS), volume 170 of LIPIcs, pages 64:1-64:15, held online, August 2020*.

[C10] L. Keiler, C. V. G. C. Lima, A. K. Maia, R. Sampaio, and I. Sau. Target set selection with maximum activation time. *In Proc. of the XI Latin and American Algorithms, Graphs and Optimization Symposium (LAGOS), volume 195 of Procedia Computer Science, pages 86-96, held online, May 2021*.

[C11] J. Araújo, M. Bougeret, V. A. Campos, and I. Sau. A new framework for kernelization lower bounds: the case of Maximum Minimal Vertex Cover. *In Proc. of the 16th International Symposium on Parameterized and Exact Computation (IPEC), volume 214 of LIPIcs, pages 4:1–4:19, held online, August 2021*.

[C12] P. T. Lima, V. F. dos Santos, I. Sau, U. S. Souza and P. Tale. Reducing the vertex cover number via edge contractions. *In Proc. of the 47th International Symposium on Mathematical Foundations of Computer Science (MFCS), volume 241 of LIPIcs, pages 69:1–69:14, Vienna, Austria, August 2022*.

Organization of conferences in the period 2019-2023, with focus on ICGT 2022

In the considered period, I have been the **co-chair** and **main organizer**, in June 2019, of the 45th International Workshop on Graph-Theoretic Concepts in Computer Science (WG), Vall de Núria, Catalonia (60 participants). But definitely, my most relevant organizing activity up to date has been to be the **chair** and **main organizer**, in July 2022, of the 11th International Colloquium on Graph Theory and combinatorics (ICGT), and I would like to provide more information about it.

ICGT is a conference created in the honour of Claude Berge in 1976 and organized by the French community in Graph Theory every 4 or 5 years. It is, without any doubt, the most important French conference on Graph Theory, and one of the most importants in Europe, so it was a honor for me to have the opportunity to organize it. ICGT 2022 was held fully in-person and had around 150 participants and 9 invited speakers among the worldwide leaders on Graph Theory and Combinatorics. As the main organizer of the conference, I had the leading role in a number of different tasks, ranging from choosing the Scientific Committee and the invited speakers, communicating with all of them, designing the webpage, making the corresponding announcements, discussing the selection of the accepted papers through Easychair, making the programme of the conference, asking for funding at several instances (I managed to obtain around 10k€), setting up the budget, booking the lecture rooms at the university and the rooms at the student residence in the campus, planning the meals, the coffee breaks and the social activity (including the conference dinner), answering the many emails of the registered participants, writing invitation and participation letters, or organizing, as an editor, the forthcoming special issue of the journal DMTCS devoted to ICGT 2022. This has been a very rewarding task for me, but it has also consumed a considerable part of my working time during a number of months.

Supervised students in the period 2019-2023

09/2018-03/2019	**Guilherme Gomes (Ph.D internship, advised in Brazil by Vinícius dos Santos)**: Generalizations of matching cuts in graphs.
09/2018-08/2019	**Raul Lopes (Ph.D internship, advised in Brazil by Victor A. Campos)**: On the tractability of the Directed Disjoint Paths problem.
02/2020-06/2020	**Nour Karnib (M2 internship, co-supervised with Marin Bougeret)**: Bridge-depth: combinatorial and algorithmic properties.
10/2020-09/2023	**Giannos Stamoulis (Ph.D, co-supervised with Dimitrios M. Thilikos)**: Algorithmic meta-theorems for graph modification problems.
03/2022-08/2022	**Laure Morelle (M2 internship, co-supervised with Dimitrios M. Thilikos)**: Modification problems on graphs: algorithms, logic, and combinatorics.
09/2022-08/2025	**Laure Morelle (Ph.D, co-supervised with Dimitrios M. Thilikos)**: Optimizing the efficiency of meta-algorithmic techniques for graph modification problems.
01/2023-12/2026	**Eric Brandwein (Ph.D, co-supervised with Flavia Bonomo-Braberman from Universidad de Buenos Aires, Argentina)**: Thinness and related graph parameters.
10/2023-9/2025	**Guilherme Gomes (postdoc, funded by a MSCA –Marie Sklodowska-Curie Action– grant)**: Parameterized complexity and kernelization for enumeration. *We have recently been awarded this prestigious MSCA postdoc grant from the European Commission for 24 months, and Guilherme will soon come to work in Montpellier as a postdoc under my supervision.*
2023-2025	**2 postdocs funded by my ANR JCJC projet ELiT**. *Starting from September 2023, I plan to recruit 2 postdocs (one year each) to work under my supervision at LIRMM, Montpellier, fully funded by my ANR JCJC projet* ELiT. *The webpage of the project can be found here.*

INVITED TALKS AND COURSES IN THE PERIOD 2019-2023

6/2019 **Efficient algorithms parameterized by treewidth.**
Invited talk at the *X Latin and American Algorithms, Graphs and Optimization Symposium (**LAGOS 2019**), Belo Horizonte, Brazil* (webpage).

6/2020 **FPT algorithms for hitting forbidden minors.**
Invited talk at the *20th Haifa Workshop on Graph Theory, Combinatorics and Algorithms, held online* (webpage). *Uri N. Peled Memorial Lecture.*

6/2022 **Algorithmic aspects of minor-closed graph classes.**
Invited course (5h30) at the *summer school of GT Graphes **SGT** (School of Graph Theory), Murol, France* (webpage).

2/2023 **Graph modification problems with forbidden minors.**
Invited talk at the *9th Annual International Conference on Algorithms and Discrete Applied Mathematics (**CALDAM 2023**), Gandhinagar, India* (webpage).

7/2023 **Algorithmic aspects of graph classes that are closed under minors.**
Forthcoming invited course (15h) at the *36th Escuela de Ciencias Informáticas (**ECI**), Buenos Aires, Argentina* (webpage).

TEACHING ACTIVITY IN THE PERIOD 2019-2023 (BESIDES THE ABOVE INVITED COURSES)

2018/2019 **Introduction aux noyaux**. *Cours de M2 Informatique, Université de Montpellier - **3h**.*

Algoritmos para obtenção de núcleos em Complexidade Parametrizada. *Curso no I Fortaleza Workshop em Combinatòria (ForWorC), Universidade Federal do Ceará, Fortaleza, Brazil - **6h**.* Addressed to master and Ph.D students.

2019/2020 **Introduction aux noyaux**. *Cours de M2 Informatique, Université de Montpellier - **9h**.*

Algoritmos para obtenção de núcleos. *Curso no Instituto de Matemática e Estatística da Universidade Federal Fluminense, Niterói, Brazil - **8h**.* Addressed to Ph.D students.

2020/2021 **Introduction aux algorithmes FPT**. *Cours de M2 Informatique, Université de Montpellier - **12h**.*

REFEREEING OF INTERNATIONAL RESEARCH PROJETS IN THE PERIOD 2019-2023

- **Czech** Science Foundation (Grantová Agentura Ceské Republiky – GACR), July 2018.
- Comisión de Ciencias Físicas, Matemáticas y Astronómicas del Fondo para la Investigación Científica y Tecnológica (FONCyT) de la República **Argentina**, October 2020.
- Agence Nationale de la Recherche (ANR), **France**, May 2021.
- Initiatives de Recherche à Grenoble Alpes (IRGA), Pôle MSTIC, **France**, January 2023.

MOBILITY IN THE PERIOD 2019-2023 (OR SHORTLY BEFORE)

- In 2016/2017 (shortly before the reference period): **1 year in Fortaleza (Brazil)** as a **Visiting Professor**, **teaching 96h** of an advanced course on Parameterized Complexity, which is my main area of research.
- I have conducted a number of **long research visits**, in particular to **Japan** (3 weeks in 2020) and **Brazil** (9 weeks in 2019, 4 weeks in 2020, 3 weeks in 2022, 3 weeks in 2023).