

# ISGC

Marion Maisonobe

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## ISGC Congress

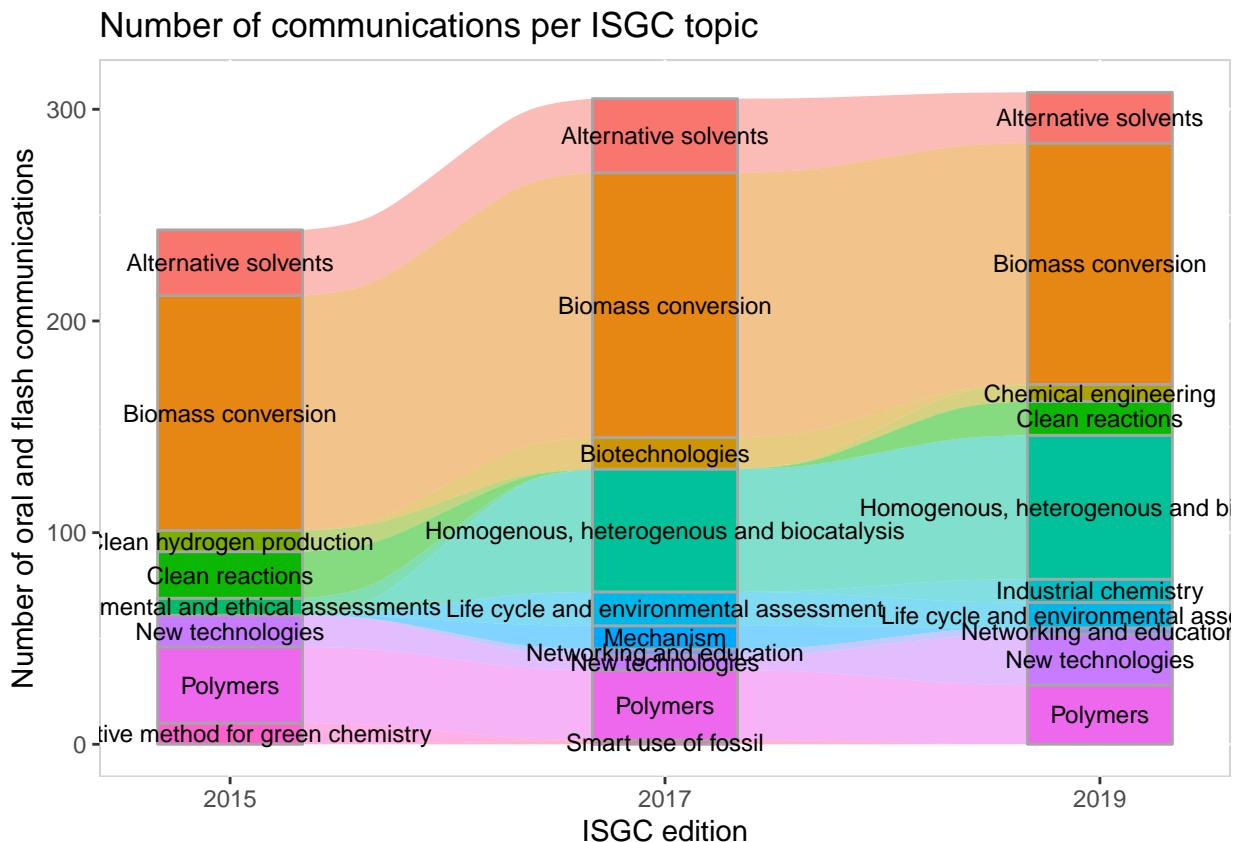
ISGC is an international conference of green chemistry held every two years in La Rochelle since 2013. In the frame of the NETCONF research project we focus on several editions of the conference in order to study its structure and dynamics. We are interested in communications, panels, topics, participants and their geographical origin. We consider studying conferences can bring many insights on emergent scientific communities, both regarding their organisation and dynamics.

## Topics

We first look at the topics associated to flash and oral communications given at the ISGC congress over time. We notice that Biomass conversion is the more popular topic. It attracted 80 communications at the 2019 edition. However, we notice that certain topics are not represented at every ISGC editions. It is notably the case of Biomass conversion which was not present at the 2017 edition. During the 2017 edition, it appears that Biomass conversion has been temporarily replaced by another category named Renewable carbon (see Table 1 below).

According to François Jérôme, the main organiser of the ISGC conference, it is possible to associate certain similar topics so that we can better analyse trends in the popularity of ISGC topics over time. I refer to his suggestions to decide which topics can be grouped together on the basis of their similarity. Following this operation, we obtain 16 unique topics.

ISGC topic	Number and % of oral and flash communications							
	2015		2017		2019		Total	
	Nb	%	Nb	%	Nb	%	Nb	%
Biomass conversion	93	38.3	0	0.0	80	26.0	173	20.2
Renewable carbon	0	0.0	125	41.0	0	0.0	125	14.6
Alternative solvents	31	12.8	35	11.5	24	7.8	90	10.5
Homogenous, heterogenous and biocatalysis	0	0.0	0	0.0	68	22.1	68	7.9
Polymers	0	0.0	33	10.8	28	9.1	61	7.1
Catalytic systems	0	0.0	58	19.0	0	0.0	58	6.8
Polymers and materials	36	14.8	0	0.0	0	0.0	36	4.2
Waste valorization	0	0.0	0	0.0	34	11.0	34	4.0
Alternative technologies	0	0.0	0	0.0	24	7.8	24	2.8
Atom-economy synthesis	22	9.1	0	0.0	0	0.0	22	2.6
Chemical valorization of wastes	18	7.4	0	0.0	0	0.0	18	2.1
Environnemental impact and life cycle assessment	0	0.0	16	5.2	0	0.0	16	1.9
Clean reactions	0	0.0	0	0.0	16	5.2	16	1.9
Eco-technology	15	6.2	0	0.0	0	0.0	15	1.8
Biotechnologies	0	0.0	15	4.9	0	0.0	15	1.8
Life cycle and environmental assessment	0	0.0	0	0.0	12	3.9	12	1.4
Mechanism	0	0.0	11	3.6	0	0.0	11	1.3
Industrial chemistry	0	0.0	0	0.0	11	3.6	11	1.3
Clean hydrogen production	10	4.1	0	0.0	0	0.0	10	1.2
Predictive method for green chemistry	10	4.1	0	0.0	0	0.0	10	1.2
Environmental and ethical assessments	8	3.3	0	0.0	0	0.0	8	0.9
Chemical engineering	0	0.0	0	0.0	8	2.6	8	0.9
Non-thermal activation methods	0	0.0	7	2.3	0	0.0	7	0.8
Networking and education	0	0.0	3	1.0	3	1.0	6	0.7
Smart use of fossil	0	0.0	2	0.7	0	0.0	2	0.2
Total	243	100.0	305	100.0	308	100.0	856	100.1



We observe that 4 topics are present at each edition of the congress: Biomass conversion (named “Renewable Carbon” at the 2017 Edition), Polymers, Alternative solvents, and New technologies. The 8 remaining topics are only present at one or two editions.

## Participation

There are different ways of approaching the conference participation. It can be analysed using registration data or through the lens of communications’ authors i.e. active participants. In the latter case, it is possible to filter the information to consider only the active participants who registered to the conference. Indeed, certain communications’ co-authors did not attend the conference.

In what follows, we consider the participation through the lens of all communications’ authors, whether they registered or not.

By counting all the speakers including industrials and keynote speakers over the 3 editions of the congress, we find a total of 3823 participants. Among them, 154 were represented at all editions, 3211 intervened to 1 edition only, (i.e. 83.99%), and 458 contributed to 2 editions.

If we limit ourselves to participants to oral communications and flash communications panels, we find a total of 2366 participants. Among them, 98 were represented at all editions, 1986 intervened to 1 edition only, (i.e. 83.94%), and 282 contributed to 2 editions.

Overall, there had been 219 oral and flash communications distinct panels: 64 in 2015, 78 in 2017, and 77 in 2019.

In chemistry, most communications are the result of a team work. At ISGC, there is an average of 4.13 authors per oral and flash communications.

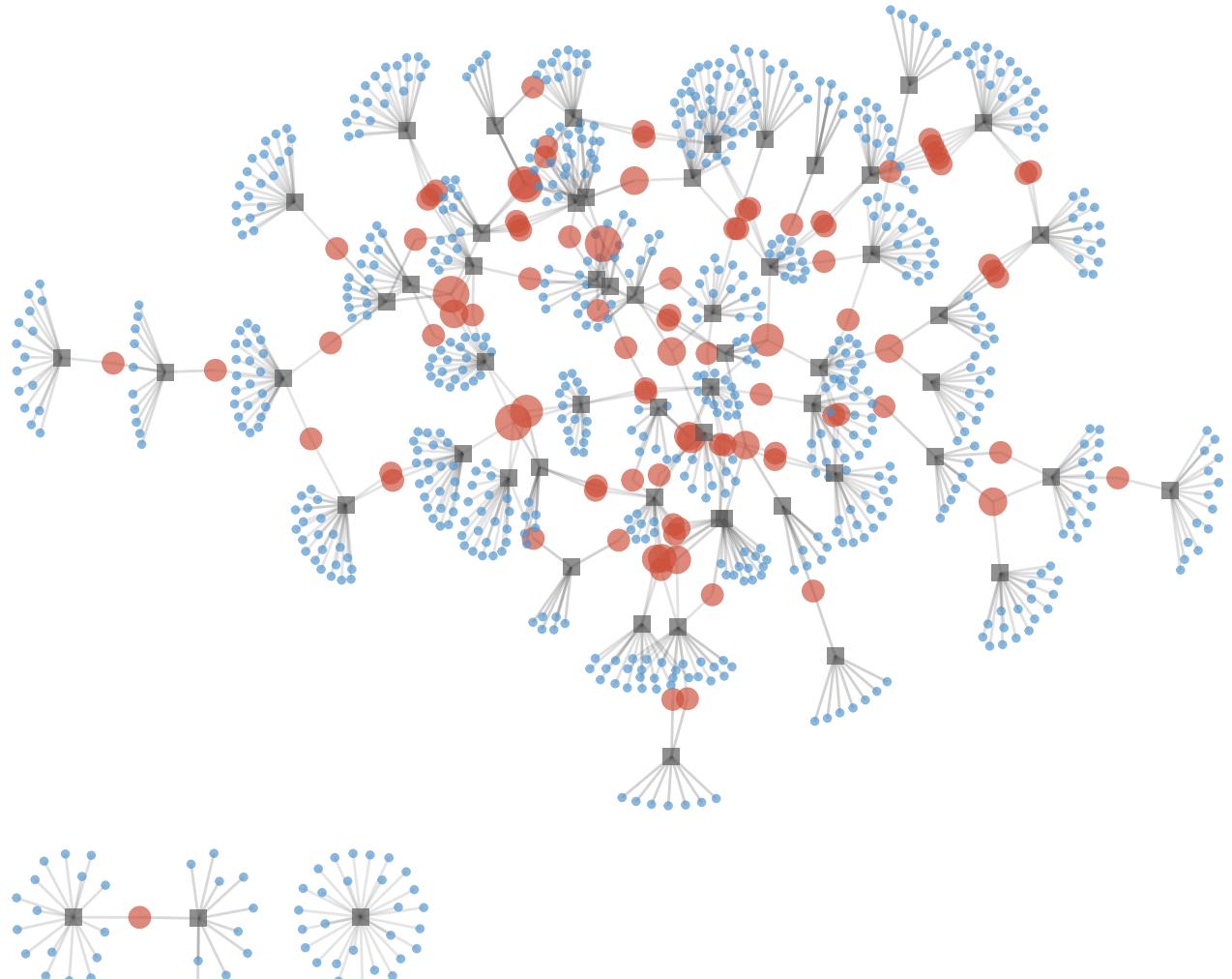
## Networks of panels

In each of the graphs below, the grey dots denote a Congress panel, the blue dots denote participants who attended only one panel, and the red dots denote ‘multi-positional’ participants who attended more than one Congress panel. Finally, the intensity of the links refers to an inverse weighting that visually accentuates participation in panels with few participants.

Remember that we are counting potential participants here: in practice, some of these participants will not have come to the Congress.

# ISGC Congress 2015

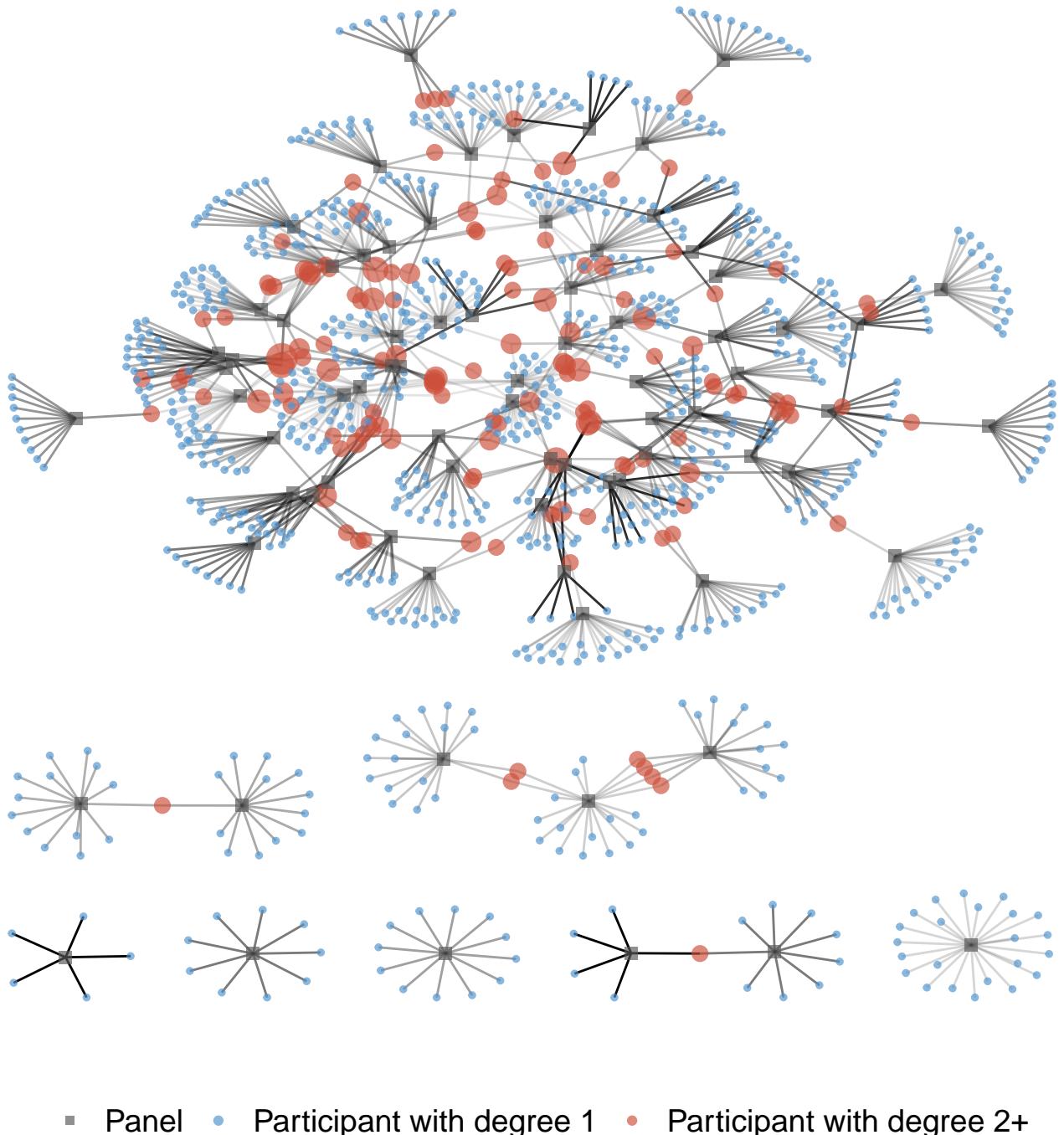
64 panels, 874 participants



- Panel
- Participant with degree 1
- Participant with degree 2+

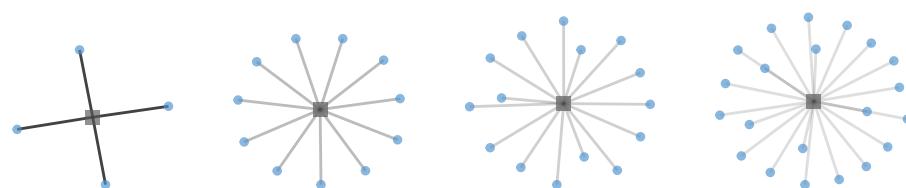
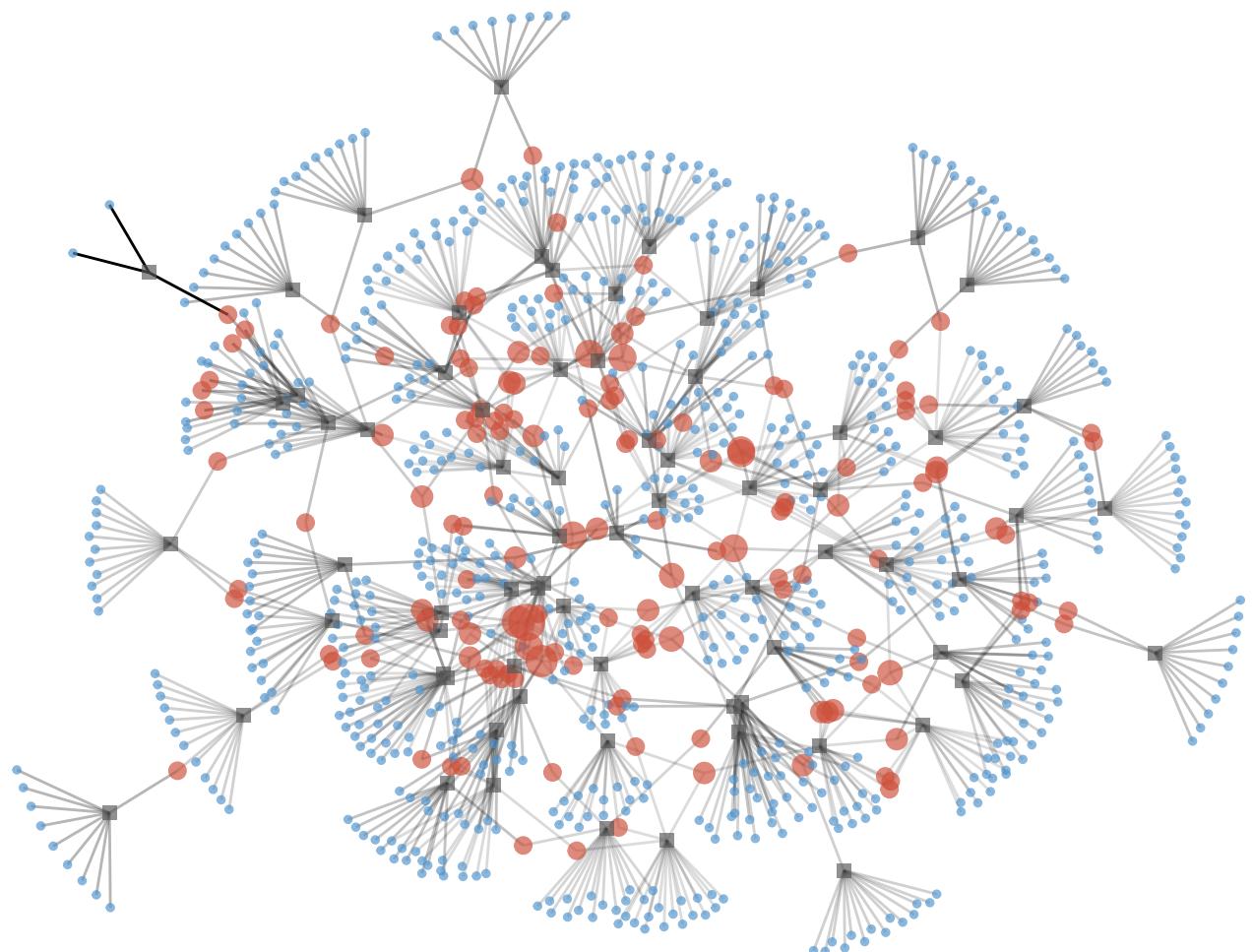
# ISGC Congress 2017

78 panels, 1009 participants



# ISGC Congress 2019

77 panels, 961 participants



- Panel
- Participant with degree 1
- Participant with degree 2+

ISGC Congress	Panels	Participants	Ratio	% degree 1	% degree 2+	C - 1
2015	64	874	13.7	89.2	10.8	8
2017	78	1009	12.9	86.4	13.6	7
2019	77	961	12.5	84.5	15.5	4

Are there more and more multi-positional participants - degree 2+ in these bipartite graphs - at the ISGC Congress? The answer is yes, slightly more, which can partly result from the opportunities offered by the increased number of panels. From 2015 to 2017, the number of multi-positional participants increased from 10.8 to 15.5%, i.e. an increase of 43.52%. At the same time, the number of panels increased from 64 to 77, an increase of 20.31% (see Table 2 below). The number of multi-positional participants thus increased at a higher pace than the number of panels.

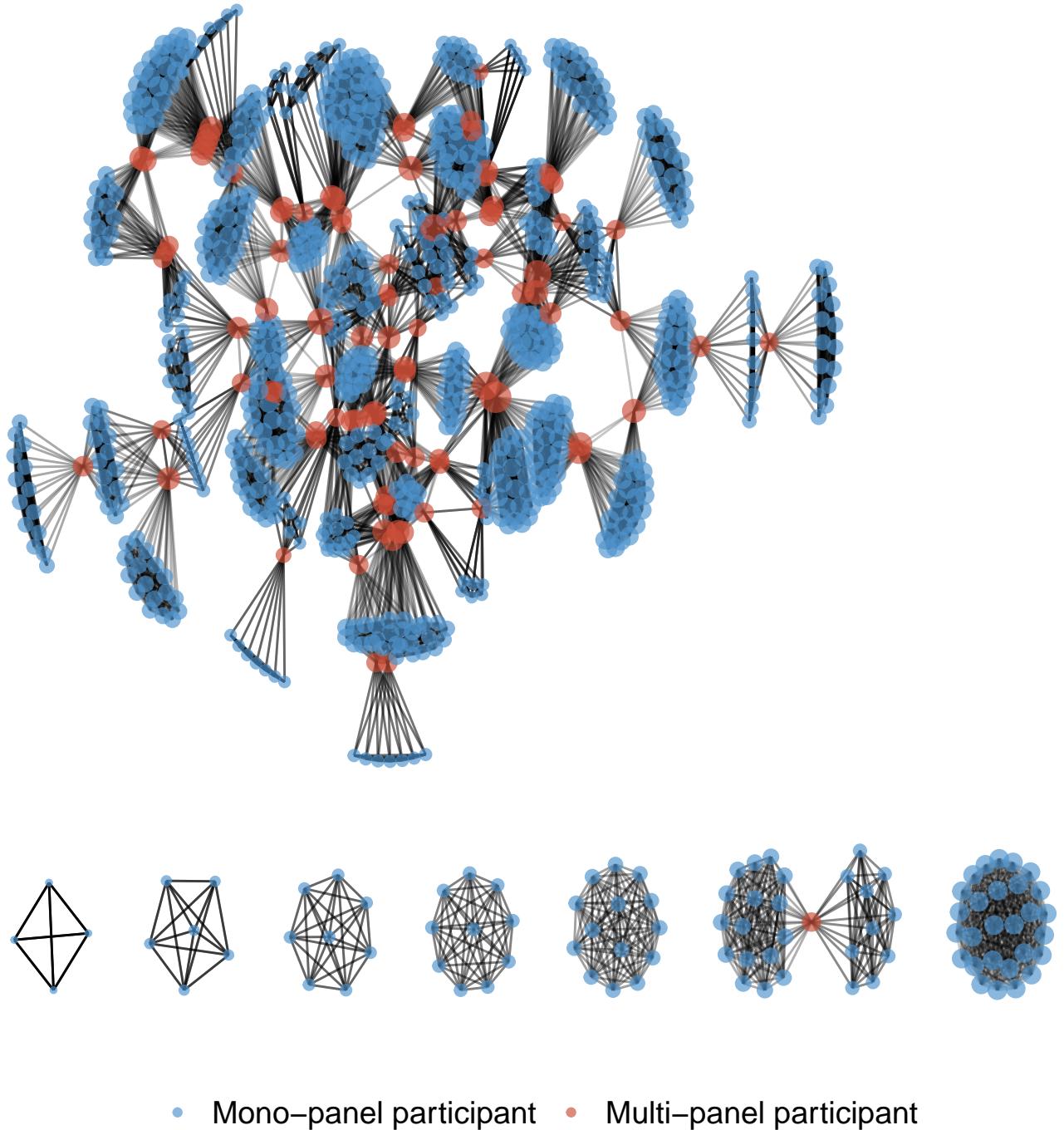
In the table above, the “Ratio” column gives the ratio of participants to panels, which drops very slightly over time. It is difficult to draw a conclusion on the fragmentation of the conference as the number of panels at the ISGC is the result of the organisers’ choices when setting up the programme and not of the participants. Indeed, the participants of the ISGC congress choose to associate their paper with a main topic and it is on this basis that the papers are then grouped into panels.

The number of isolated components of the graph, noted as “C - 1” above because only components not connected to the main component have been counted, corresponds to the number of panels in which no participant took part in any other panel of the Congress. This figure is decreasing over time, from 8 in 2015 to 4 in 2019, i.e. a drop of 50%.

In the one-mode networks below, the blue dots indicate participants who attended only one panel of the Congress edition concerned; the red dots indicate participants who attended several panels.

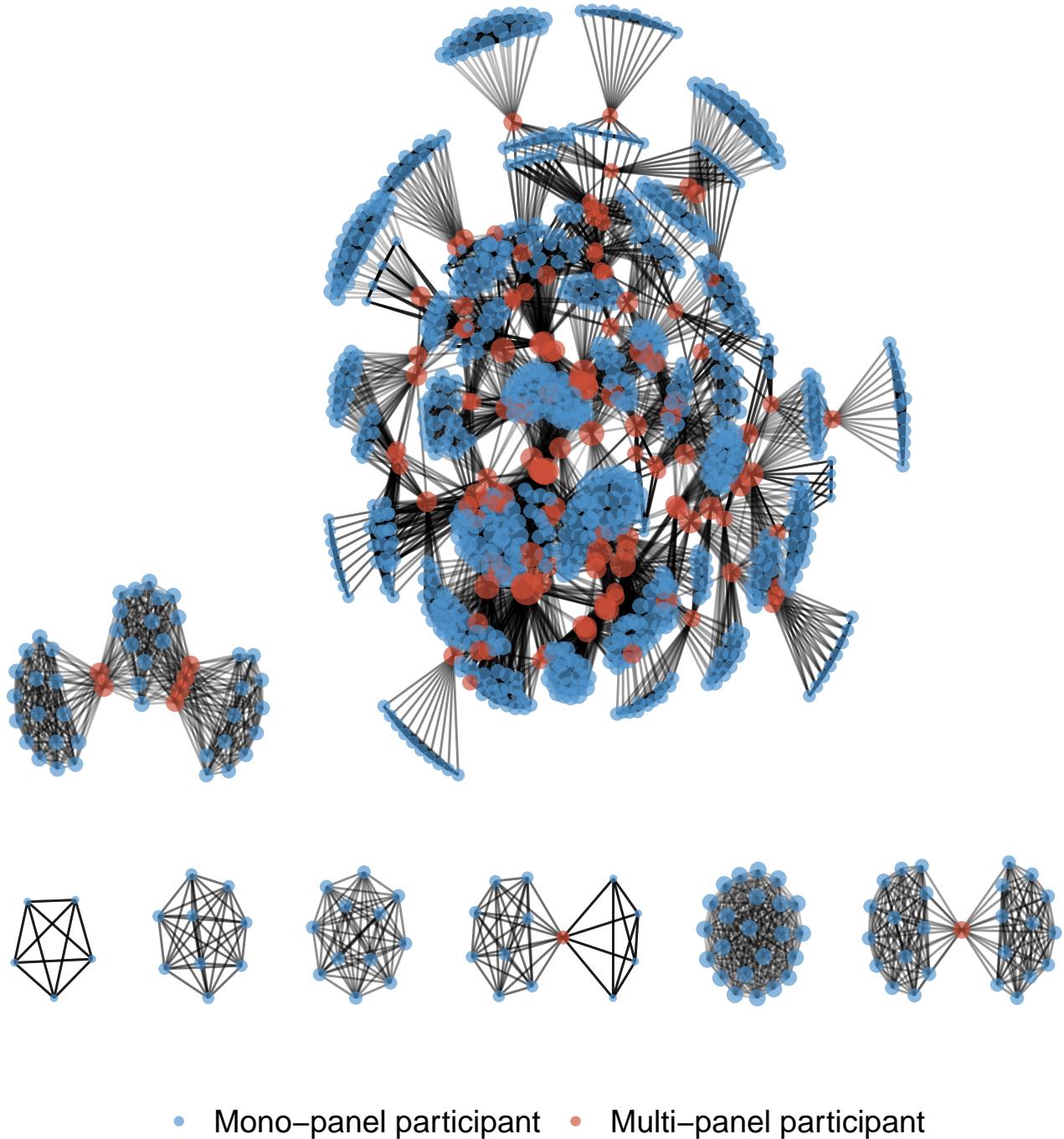
# ISGC Congress 2015

779 participants, 94 multi–panels



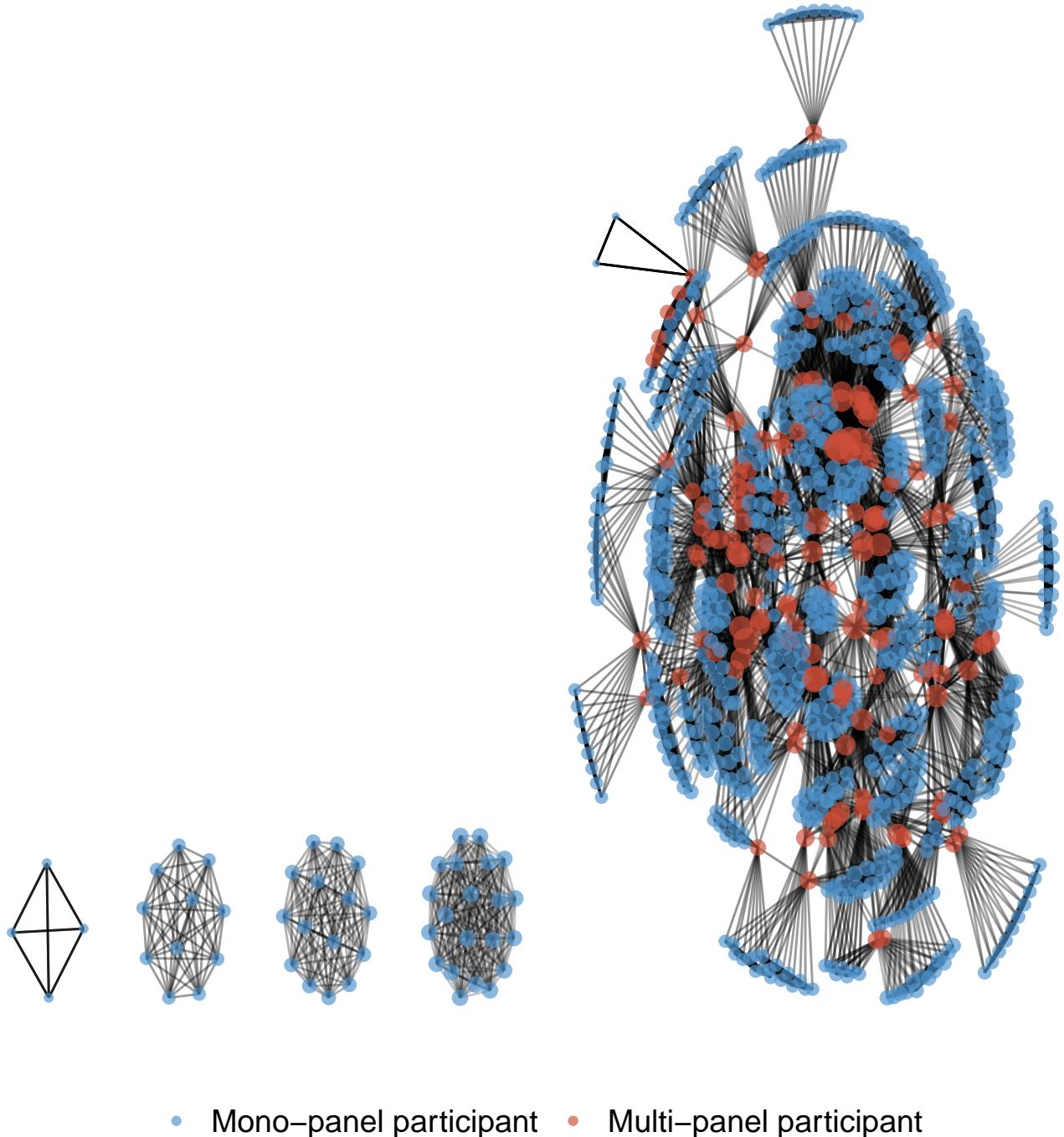
# ISGC Congress 2017

872 participants, 137 multi–panels



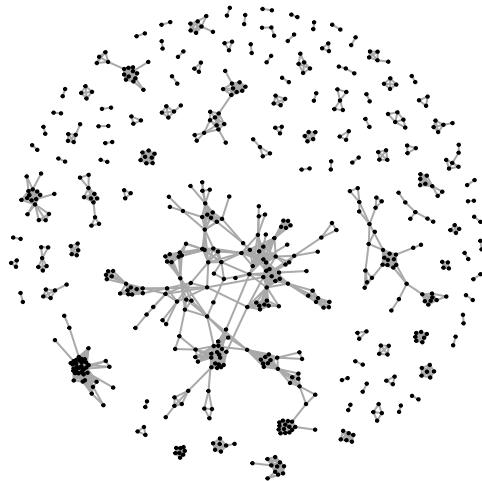
# ISGC Congress 2019

812 participants, 149 multi–panels



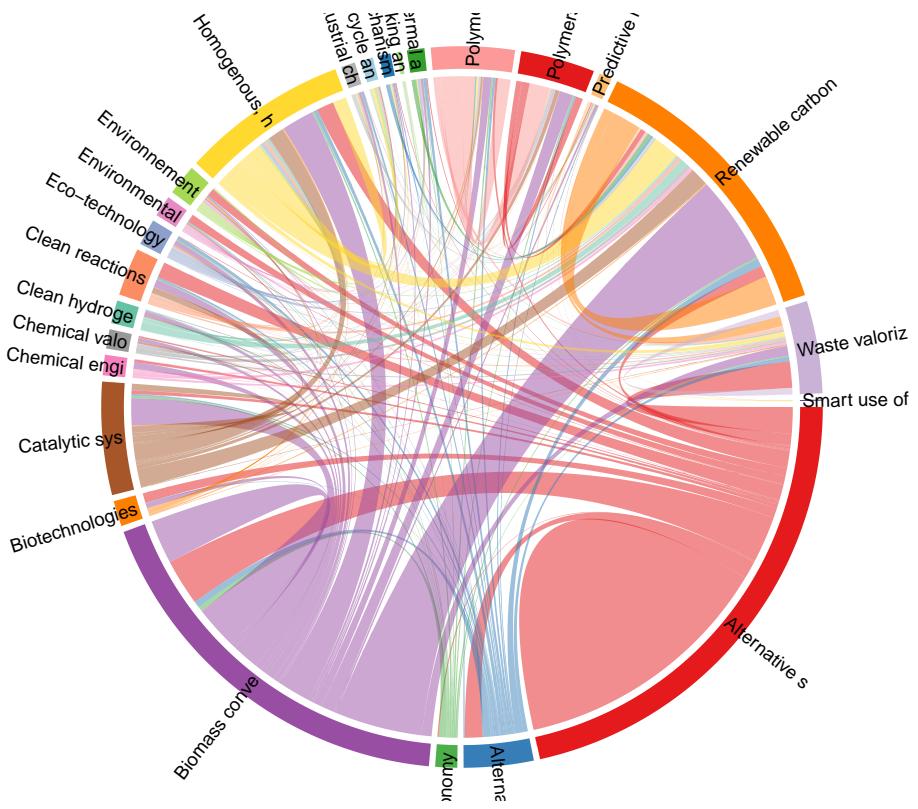
## Linking communications according to common authors and topics

We now consider the network of oral and flash communications sharing one author at least.



It counts 645 communications, among which 172 from the 2015 edition, 242 from the 2017 edition, and 231 from the 2019 edition.

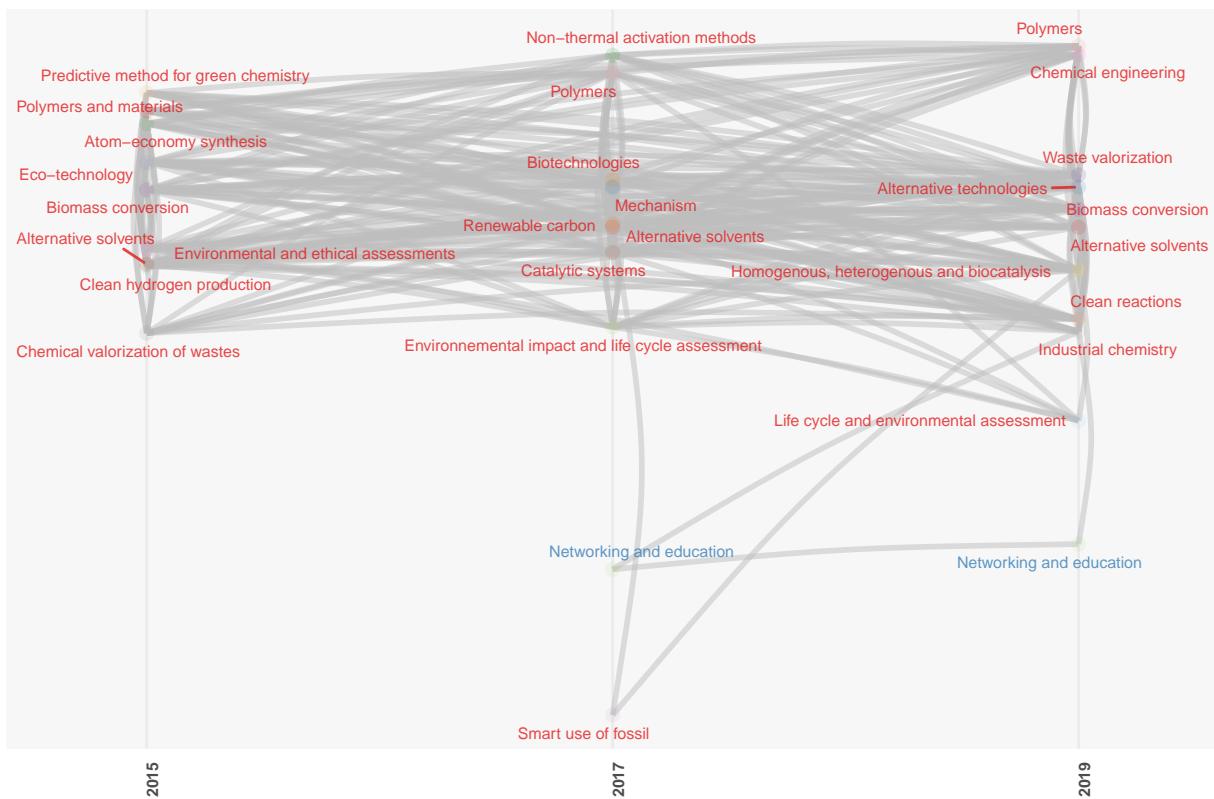
There are 607 communications with different topics but at least one common authors. We here consider the original topics' name before the recoding suggested by François Jérôme's expertise. We group all the communications according to their topic and attempt to visualise the relations between topics.



The chord diagram with 25 different topics is not easy to read but it confirms the important link between Biomass conservation and Renewable Carbon that we grouped together in the 16 categories topic variable.

Since certain original topics were only present in certain editions we attempt to visualise the relations between topics using an historical layout. This network is derived from the network of communications having at least one common author.

## Historical layout



Let now consider the network of relations between ISGC topics using the list of topics recoded into 16 categories.

