From Valencia to ISBA

How Bayesian research themes evolved from the first Valencia meeting in 1979 to the ISBA World Meeting in Nagoya in 2026, read through the titles of papers and talks

Hedibert Freitas Lopes · Insper

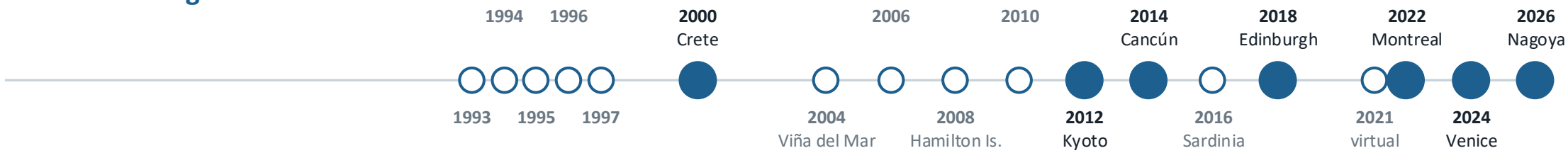
Prepared with AI assistance (Claude). Themes are keyword-coded from titles in the Valencia proceedings and in ISBA World Meeting programs; see the method slide.

Two series of meetings, 1979–2026

Valencia International Meetings



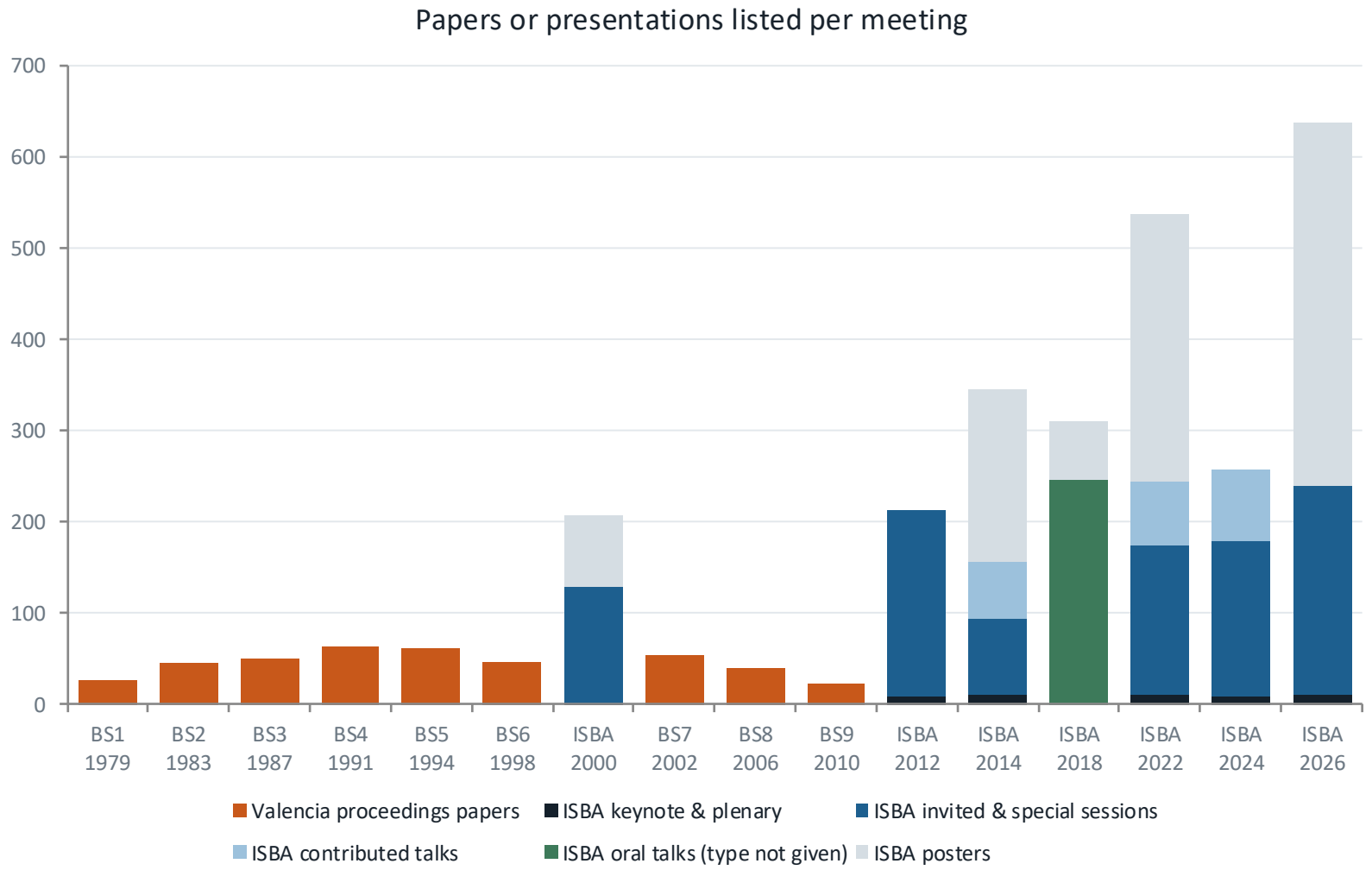
ISBA World Meetings



1993–1997: San Francisco, Alicante, Oaxaca, Cape Town, Istanbul

Filled: analysed here. Hollow: not analysed (program not obtained, or, for 1994, 2006 and 2010, held jointly with a Valencia meeting already counted).

A change of scale



26 → 637

papers in BS1 (1979) vs. presentations in the ISBA 2026 program

7×

the median ISBA program lists about 7 times more titles than the median Valencia volume

Gaps

2012 lacks contributed talks and posters; 2024 prints no posters; 2018 does not label talk types

Five phases of Bayesian research

1

1979–1987

BS1–BS3

Foundations & decision

Coherence, de Finetti, subjective probability, elicitation, robustness. Computation is analytic.

2

1991–1994

BS4–BS5

The computational turn

Gibbs sampler, convergence, BUGS; intrinsic Bayes factors, graphical models.

3

1998–2002

BS6, ISBA 2000, BS7

MCMC applied everywhere

Spatial, medical, environmental and financial applications; official statistics; mixtures.

4

2006–2014

BS8, BS9, ISBA 2012–14

Nonparametric & high-dimensional

Dirichlet processes, sparsity, ABC, sequential Monte Carlo, genomics.

5

2018–2026

ISBA 2018–2026

Bayes meets machine learning

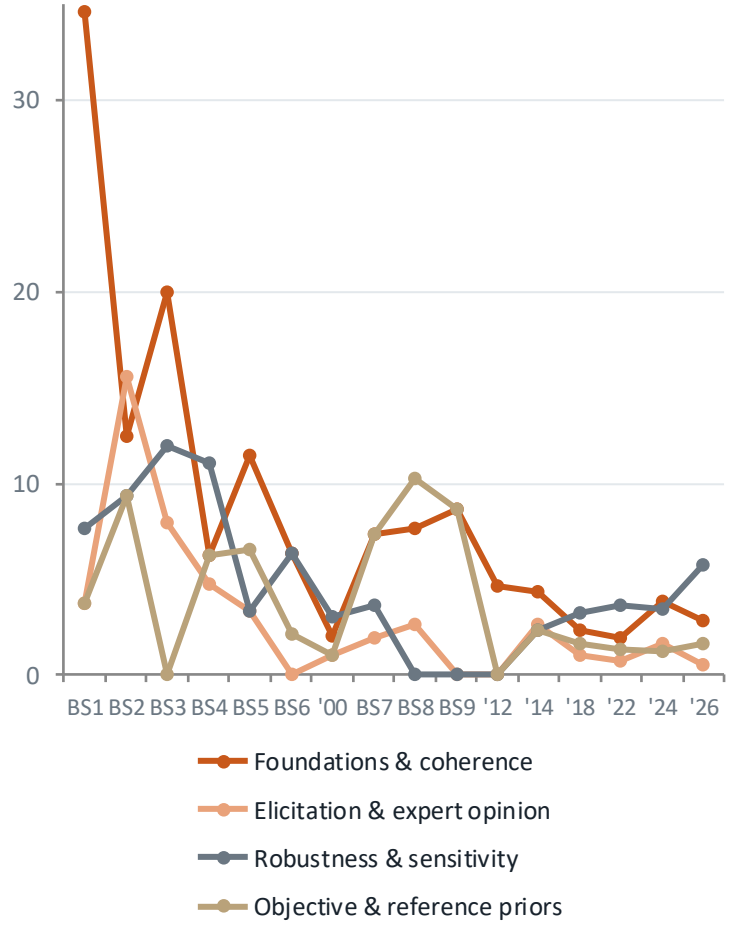
Causal inference, variational methods, BART, prediction, deep learning, networks.

Themes across 16 meetings, 1979–2026

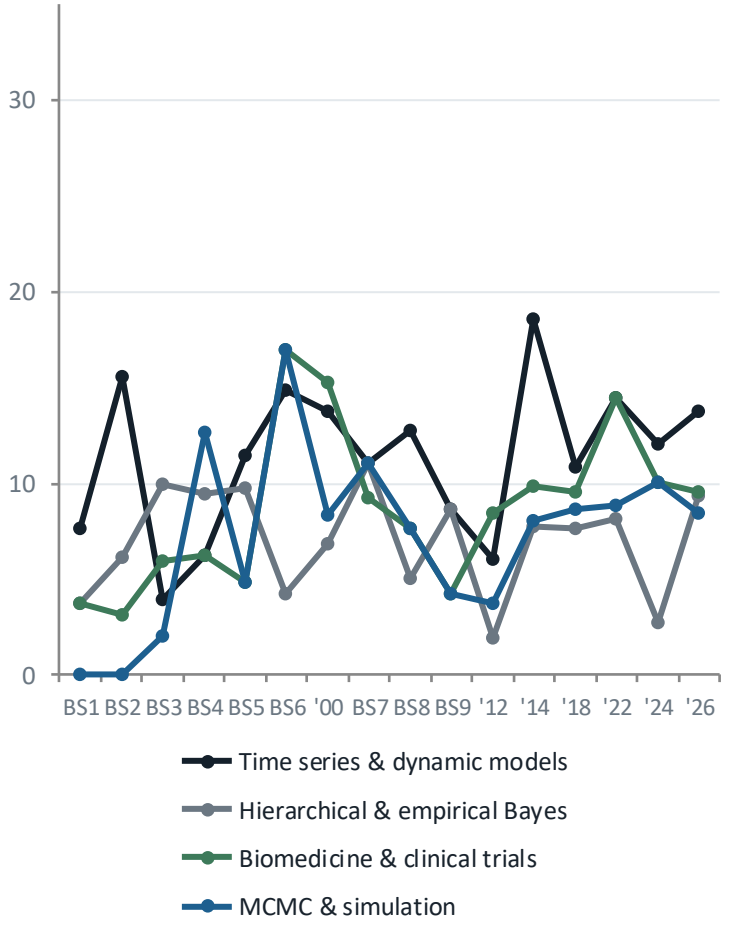
% of titles with each theme	BS1 1979	BS2 1983	BS3 1987	BS4 1991	BS5 1994	BS6 1998	ISBA 2000	BS7 2002	BS8 2006	BS9 2010	ISBA 2012	ISBA 2014	ISBA 2018	ISBA 2022	ISBA 2024	ISBA 2026
Elicitation & expert opinion	4	16	8	5	3	·	1	2	3	·	·	3	1	1	2	1
Foundations & coherence	35	13	20	6	12	6	2	7	8	9	5	4	2	2	4	3
Bayesian software	·	·	4	5	·	·	2	·	·	·	·	1	1	·	·	1
Robustness & sensitivity	8	9	12	11	3	6	3	4	·	·	·	2	3	4	4	6
Decision theory & utility	19	3	6	10	8	4	4	7	·	9	·	4	4	2	5	4
Objective & reference priors	4	9	·	6	7	2	1	7	10	9	·	2	2	1	1	2
Design & survey sampling	4	13	8	10	2	6	5	2	5	·	4	4	4	3	5	3
Regression & linear models	12	16	14	14	13	9	8	11	13	9	·	6	9	7	7	8
Testing & model choice	8	9	4	8	13	11	12	6	18	13	5	6	5	3	3	5
Approximations & integration	12	6	6	10	7	2	2	4	5	4	4	7	6	6	4	5
Prediction	8	9	6	6	8	4	4	·	3	4	1	4	3	4	5	10
Hierarchical & empirical Bayes	4	6	10	10	10	4	7	11	5	9	2	8	8	8	3	9
Social science & law	·	3	4	5	3	4	8	2	·	·	2	3	4	2	4	4
Economics, finance & reliability	·	6	4	8	2	4	9	4	·	4	14	6	2	2	5	4
Machine learning & images	8	3	2	5	12	4	4	11	8	4	·	6	4	6	9	7
Time series & dynamic models	8	16	4	6	12	15	14	11	13	9	6	19	11	15	12	14
Biomedicine & clinical trials	4	3	6	6	5	17	15	9	8	4	9	10	10	15	10	10
MCMC & simulation	·	·	2	13	5	17	8	11	8	4	4	8	9	9	10	9
Sequential Monte Carlo	·	·	·	·	2	2	3	·	3	9	3	2	3	·	1	1
Genetics & genomics	·	·	4	·	·	2	3	6	13	13	5	5	4	4	4	3
Physical & environmental sci.	·	·	·	·	7	13	3	15	5	17	6	7	7	6	6	8
Bayesian nonparametrics	4	·	4	2	12	11	7	13	21	9	12	17	12	17	16	14
Spatial & spatio-temporal	·	·	·	2	3	13	4	9	10	4	5	8	7	10	9	7
Graphical models & networks	·	·	·	5	8	2	2	4	5	9	7	6	7	9	9	7
Privacy & fairness	·	·	·	·	·	·	3	2	·	·	·	·	·	1	3	1
Mixtures & clustering	·	·	2	3	3	4	5	13	8	9	·	9	8	11	11	10
Sparsity & high dimensions	·	3	2	·	3	·	3	4	8	17	9	9	9	9	9	10
Causal inference	·	3	·	·	·	·	1	6	·	4	3	2	5	4	7	6
Variational & likelihood-free	·	·	·	·	2	·	1	2	·	·	4	1	4	6	7	5
Neural networks & AI	·	·	·	·	·	·	1	·	·	·	·	·	2	5	7	6

What faded, what held, what took over

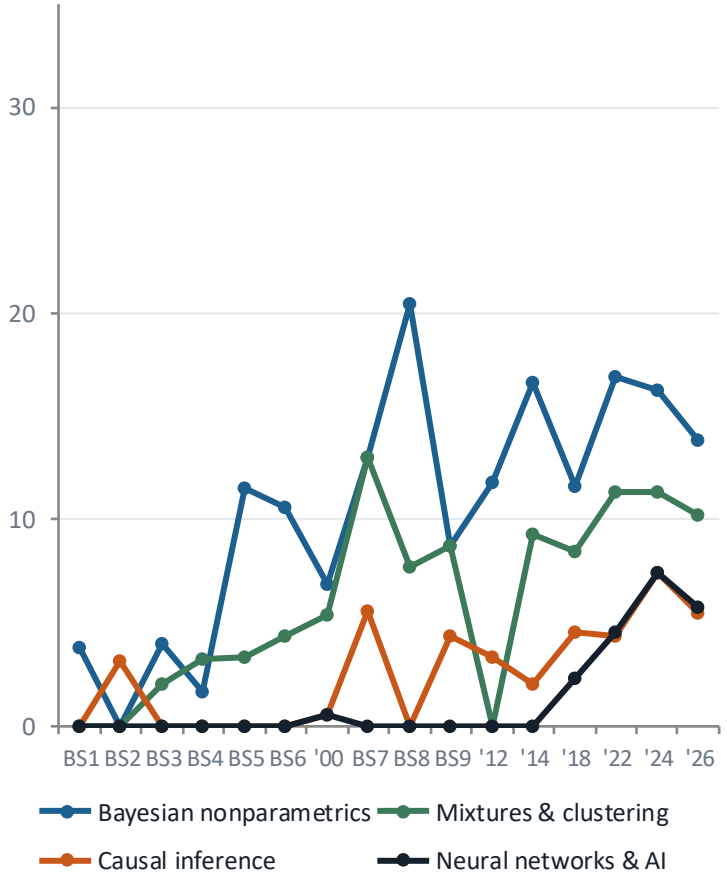
Faded: the founding agenda



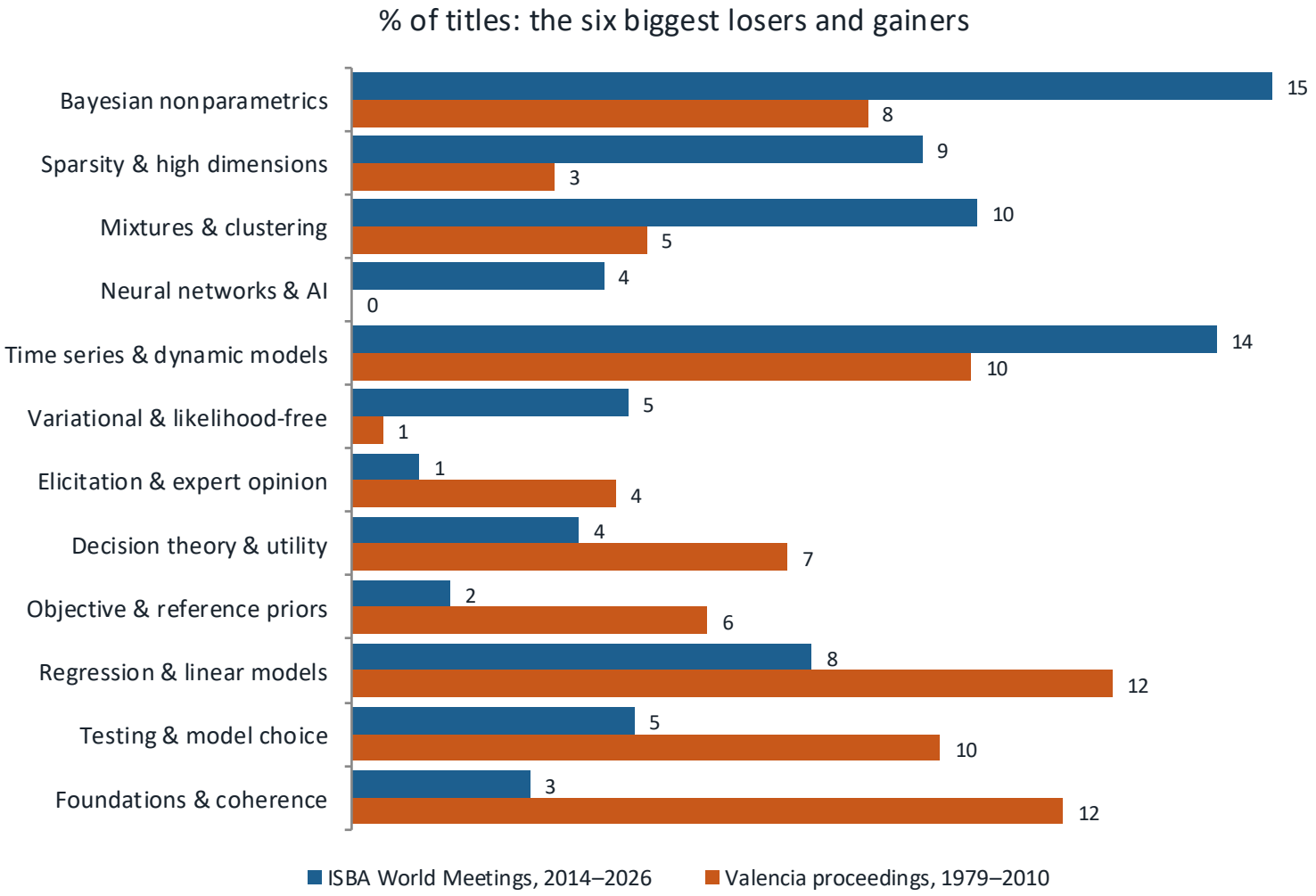
Held: the modelling core



Took over: flexible and learning models



Then and now: Valencia 1979–2010 vs. ISBA 2014–2026



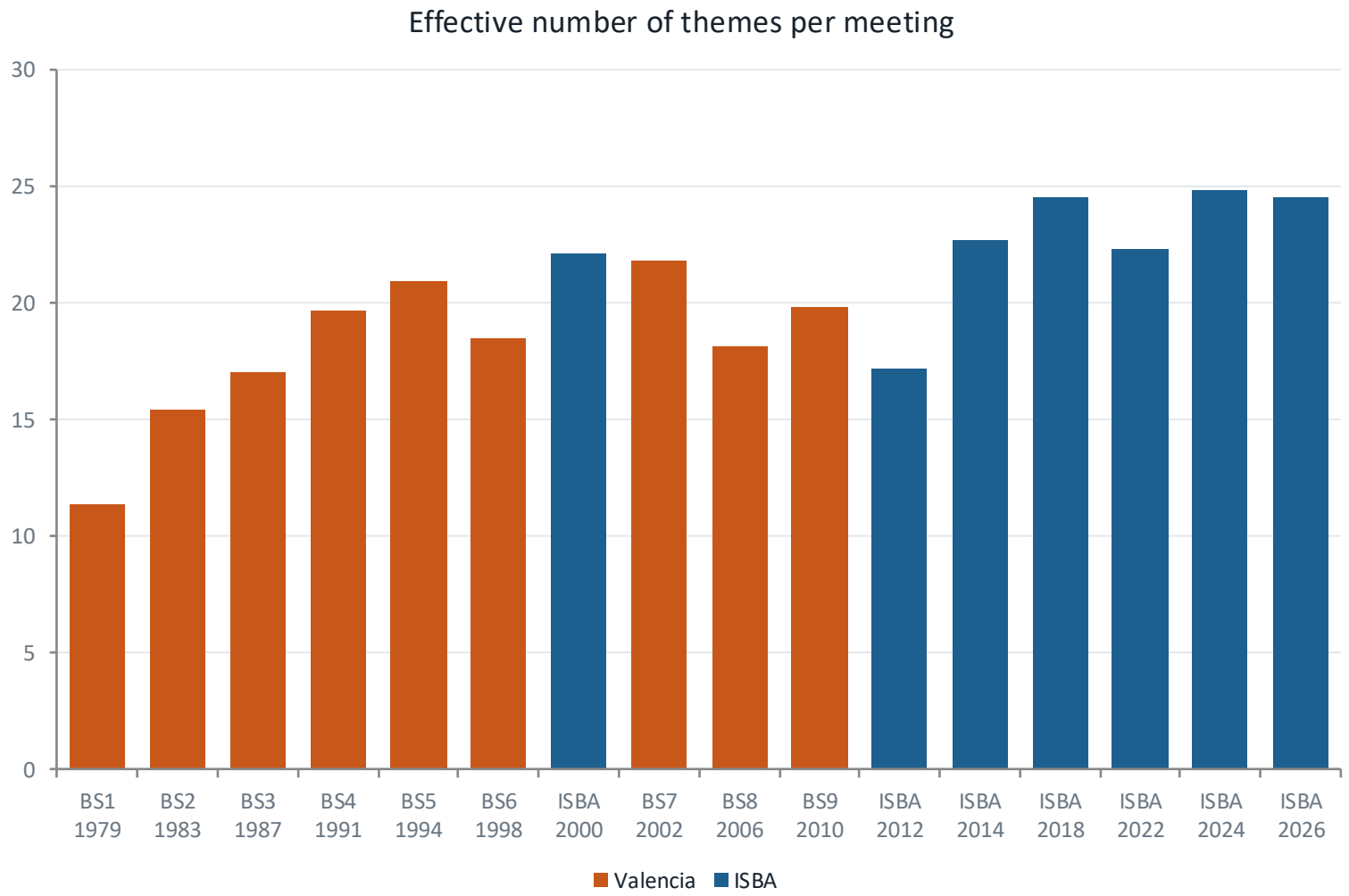
Biggest gains

- Bayesian nonparametrics +6.7 pts
- Sparsity & high dimensions +6 pts
- Mixtures & clustering +5.4 pts

Biggest losses

- Foundations & coherence -8.8 pts
- Testing & model choice -5 pts
- Regression & linear models -4.9 pts

The field diversified



11.4 → 24.5

effective themes, from BS1 in 1979 to ISBA 2026

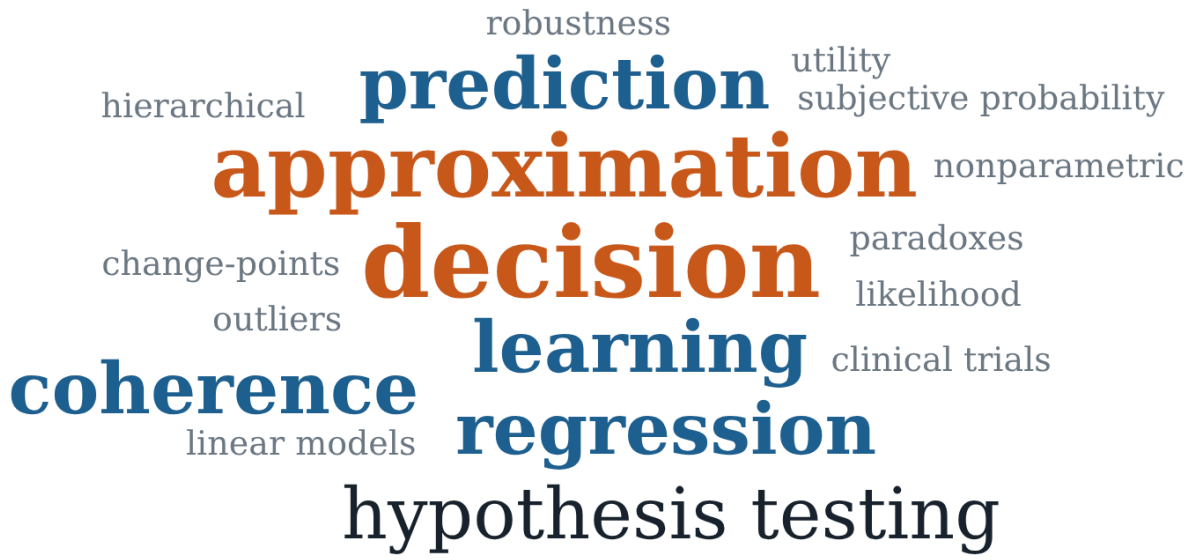
The effective number is exp(Shannon entropy) of the theme distribution: it equals k when attention is spread evenly over k themes. Early volumes concentrate on a dozen themes; the recent programs spread over about 25 of the 30.

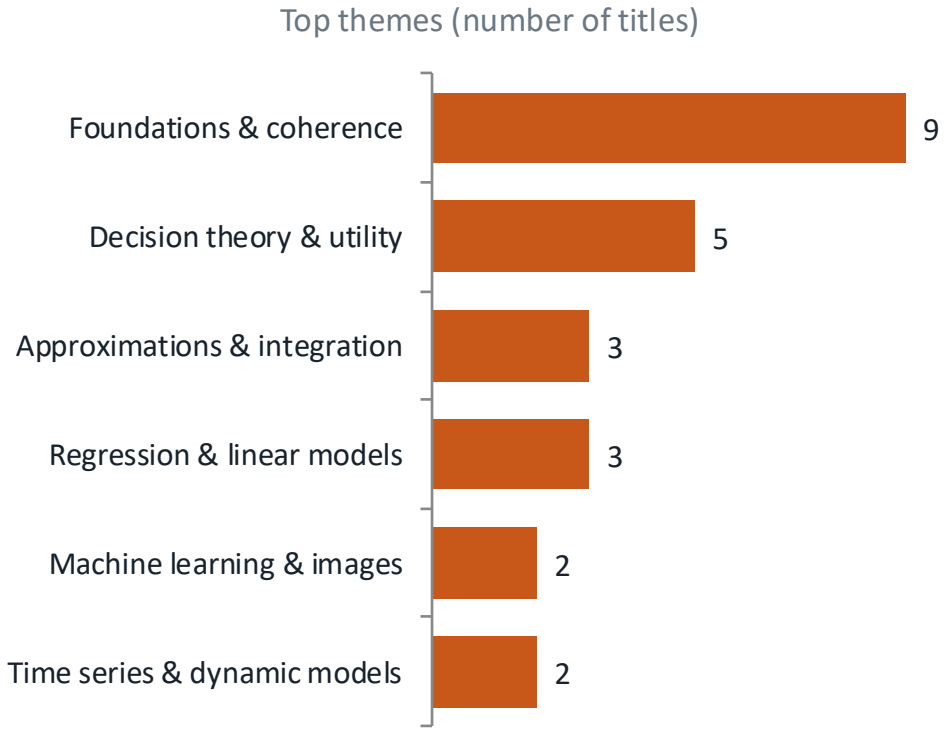
Valencia, volume by volume

Bayesian Statistics 1–9 (1979–2010): word clouds of the terms in paper titles, with the six most frequent themes

Bayesian Statistics 1 (1980)

Valencia I · Valencia, May 28 – June 2, 1979 · 26 papers

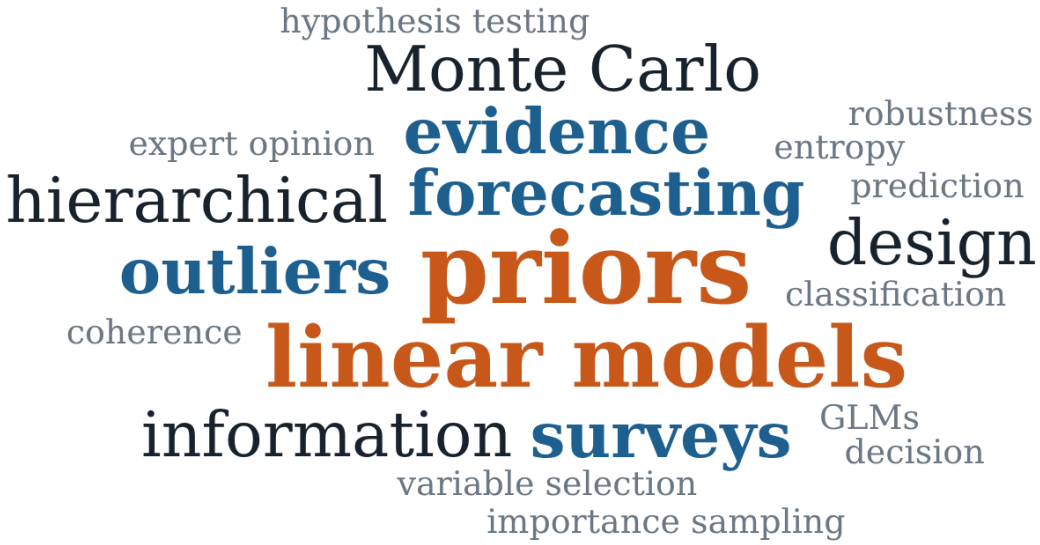


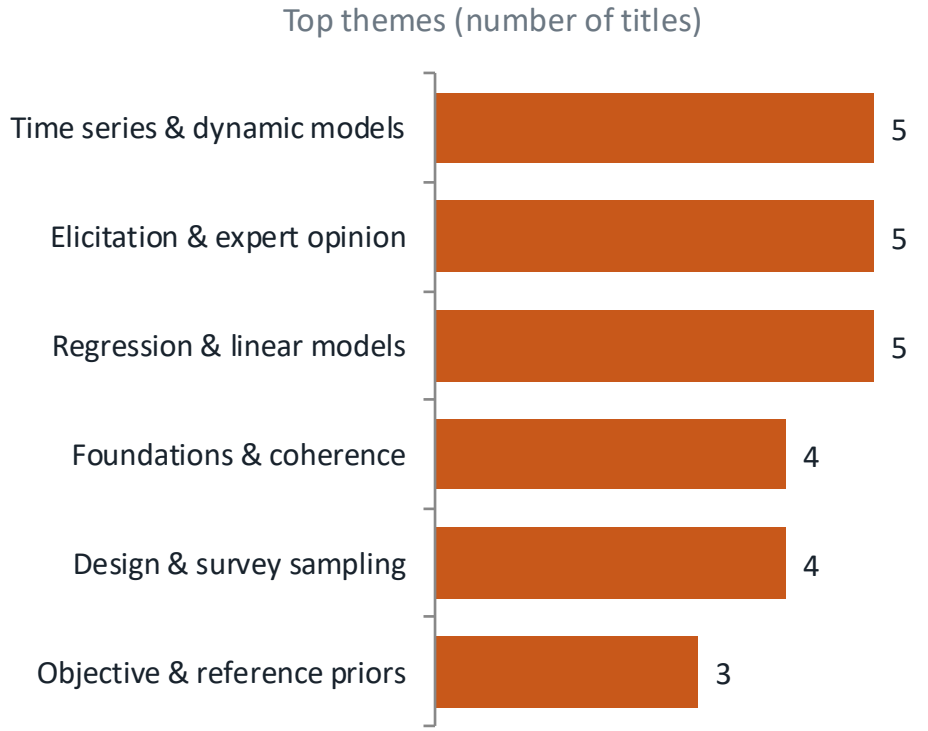


Foundations dominate: coherence, rationality, decision making and hypothesis testing. Computation means analytic approximation.

Bayesian Statistics 2 (1985)

Valencia II · Alcossebre, September 6–10, 1983 · 45 papers





Expert opinion, group consensus and prior quantification, plus the first Monte Carlo integration papers. Most titles here are reconstructed, so read this volume with caution.

Bayesian Statistics 3 (1988)

Valencia III · Altea, June 1–5, 1987 · 50 papers



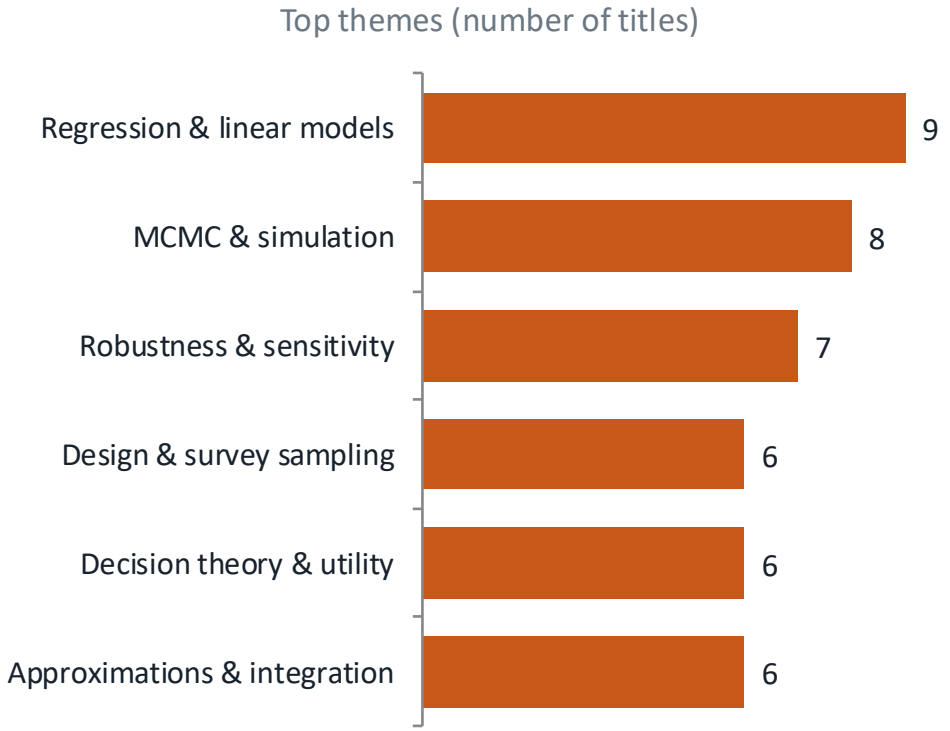


De Finetti and exchangeability, hierarchical and robust models, Bayesian software, and Rubin's SIR algorithm for simulating posteriors.

Bayesian Statistics 4 (1992)

Valencia IV · Peñíscola, April 15–20, 1991 · 63 papers

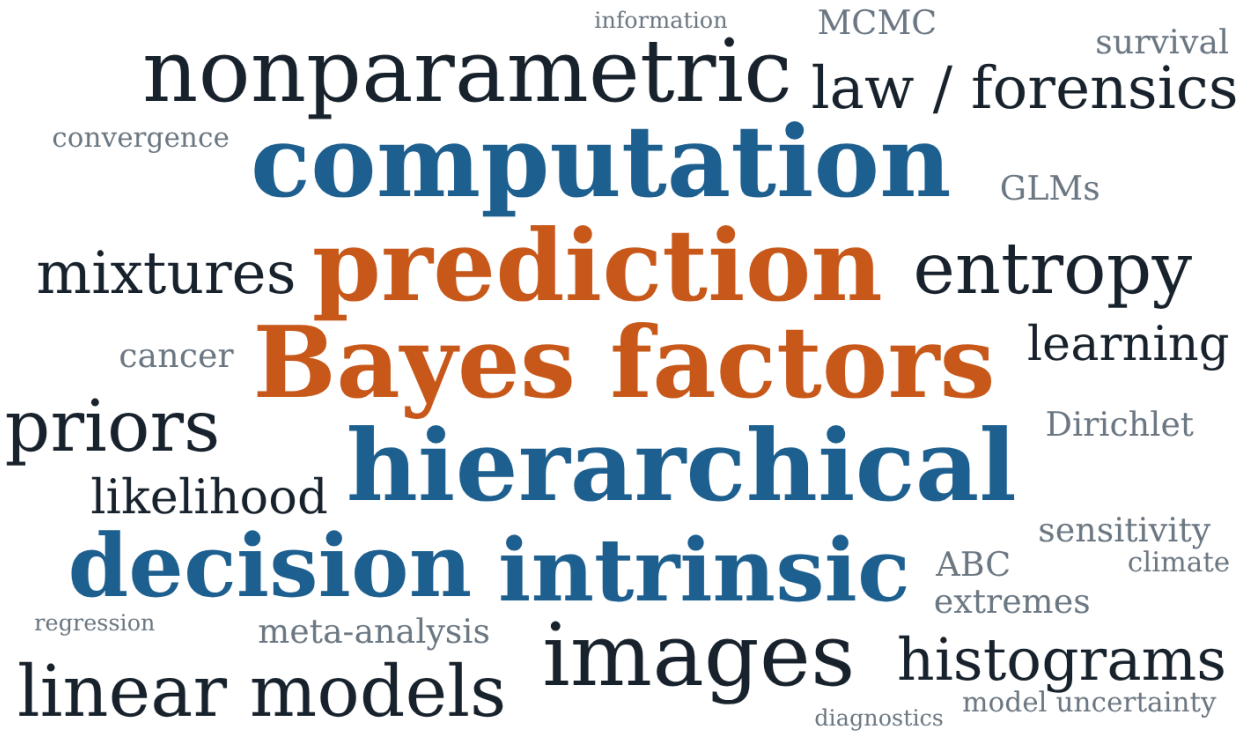


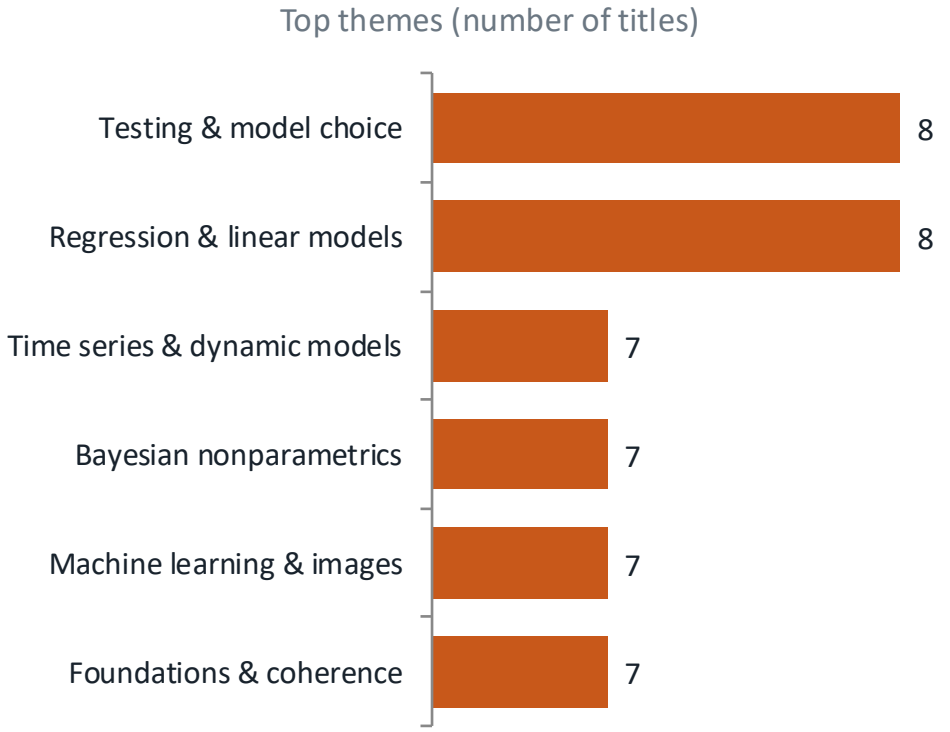


The Gibbs sampler arrives: convergence, how many iterations, BUGS. Reference priors and robustness remain central.

Bayesian Statistics 5 (1996)

Valencia V · Alicante, June 5–9, 1994 · 61 papers



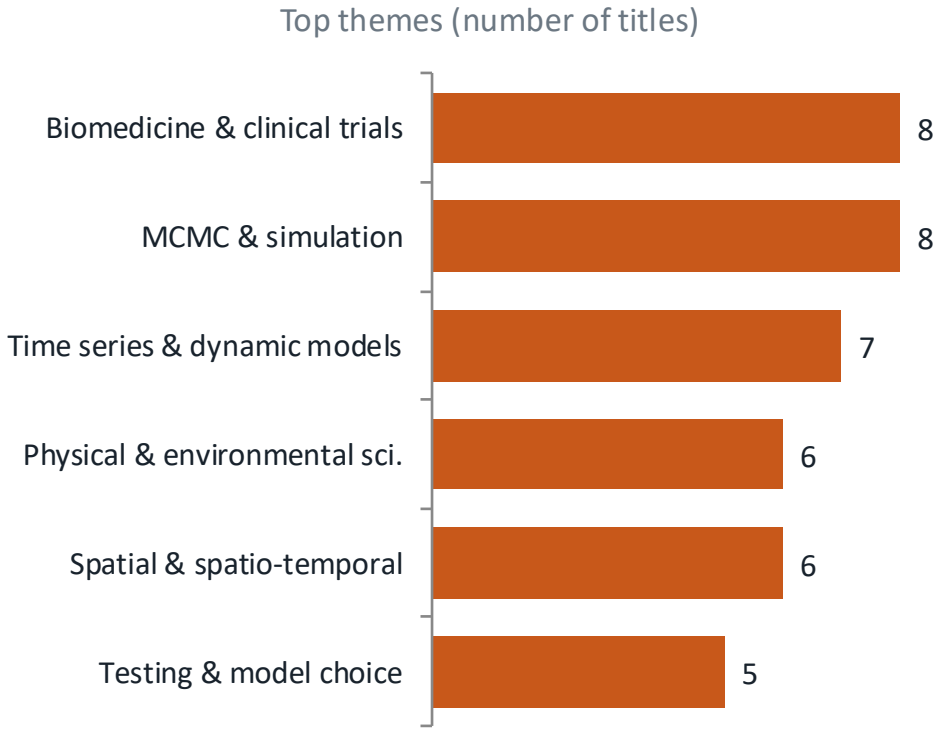


Intrinsic Bayes factors, graphical models and influence diagrams, image analysis, and nonparametric density estimation.

Bayesian Statistics 6 (1999)

Valencia VI · Alcoceber, June 6–10, 1998 · 47 papers

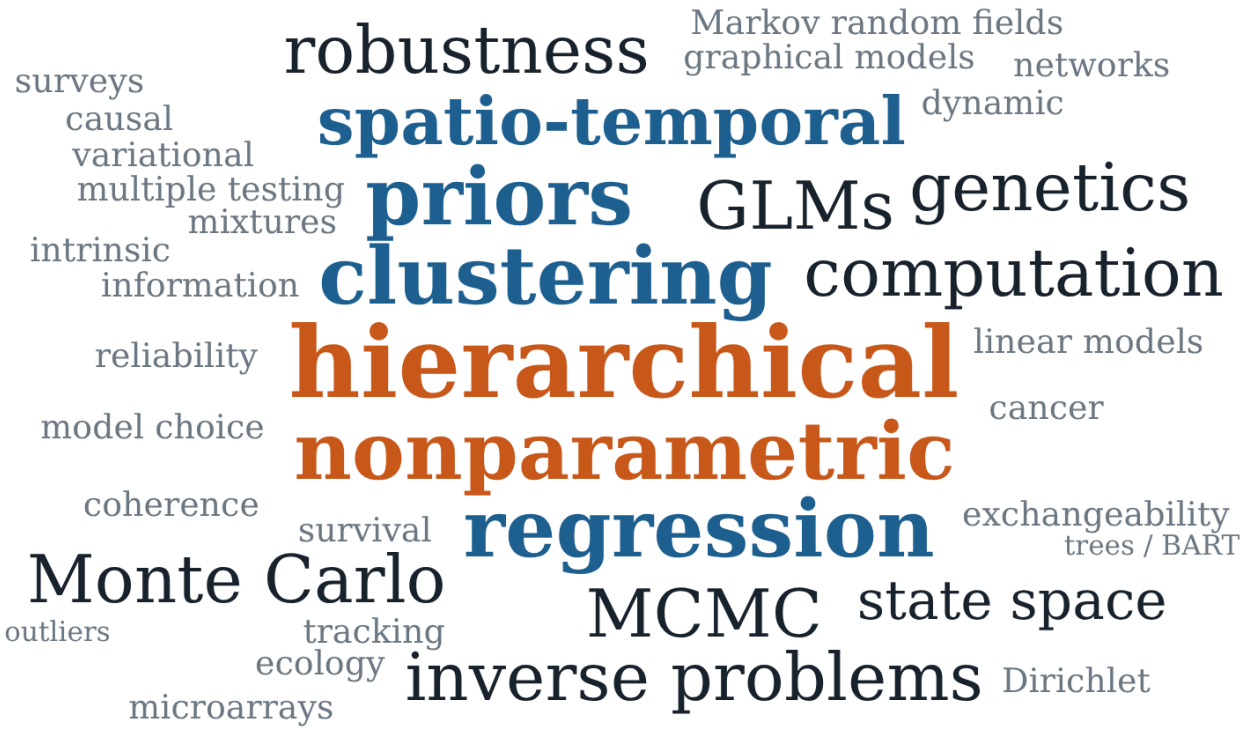


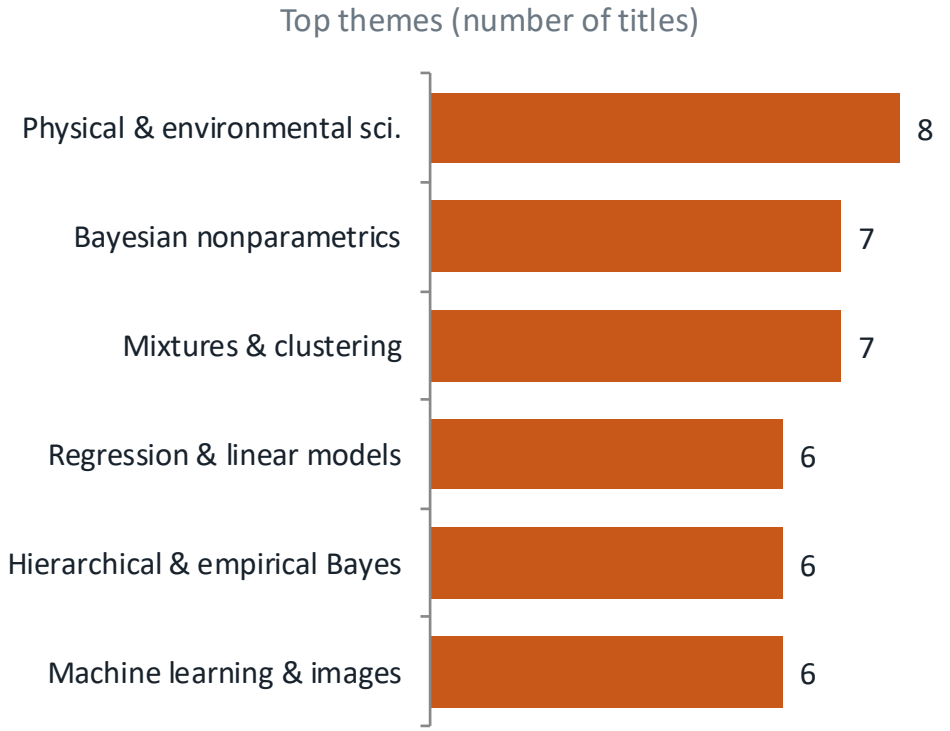


MCMC matures with reversible jump and convergence diagnostics; spatial models spread to environmental, medical and imaging problems.

Bayesian Statistics 7 (2003)

Valencia VII · Tenerife, June 2–6, 2002 · 54 papers



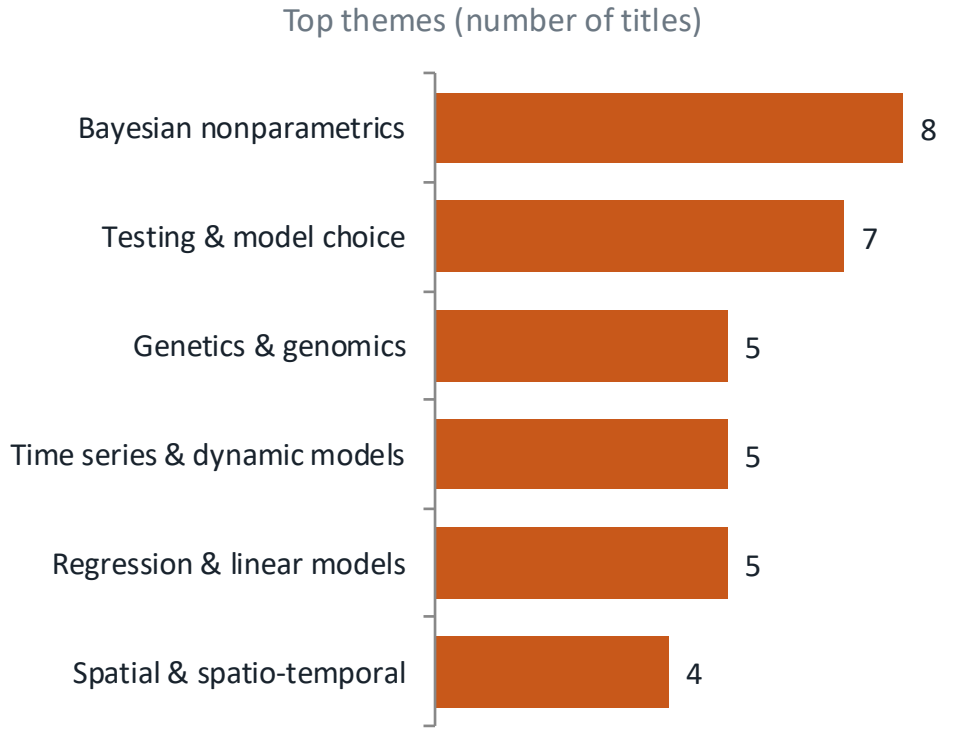


Applications everywhere: inverse problems, mixtures and clustering, nonparametrics, genomics and information retrieval.

Bayesian Statistics 8 (2007)

Valencia VIII · Benidorm, June 1–6, 2006 (joint with the ISBA World Meeting) · 39 papers

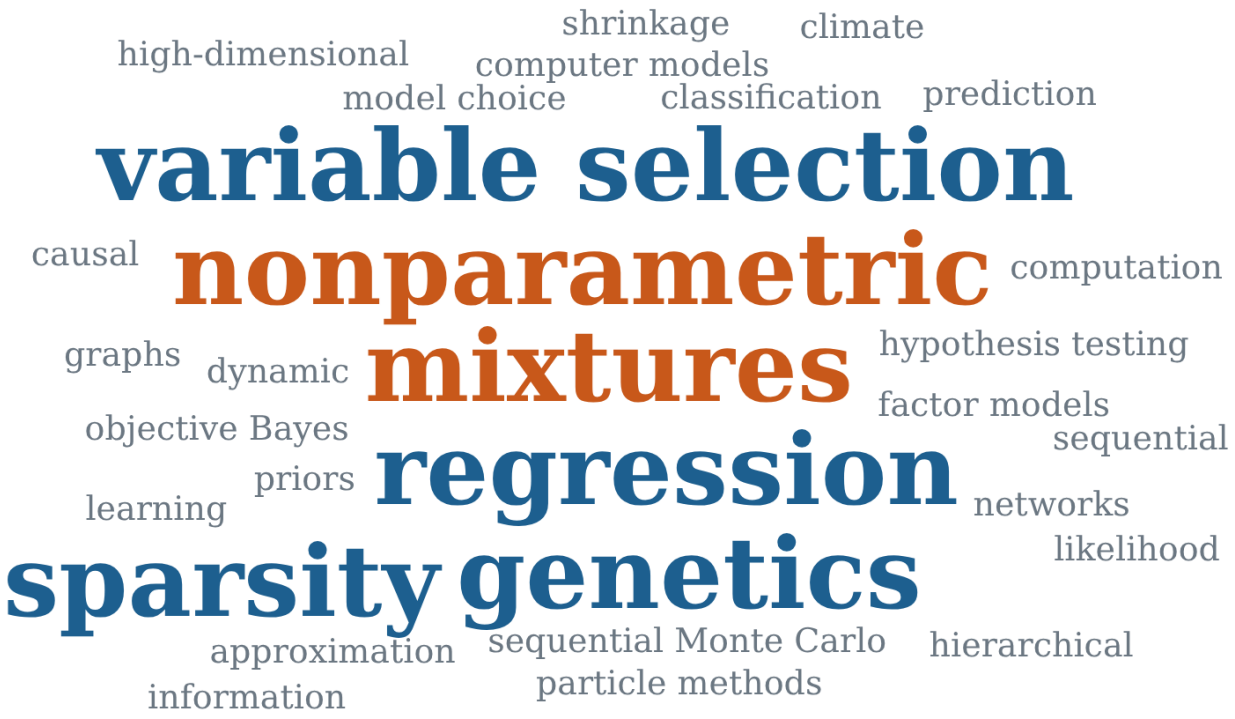


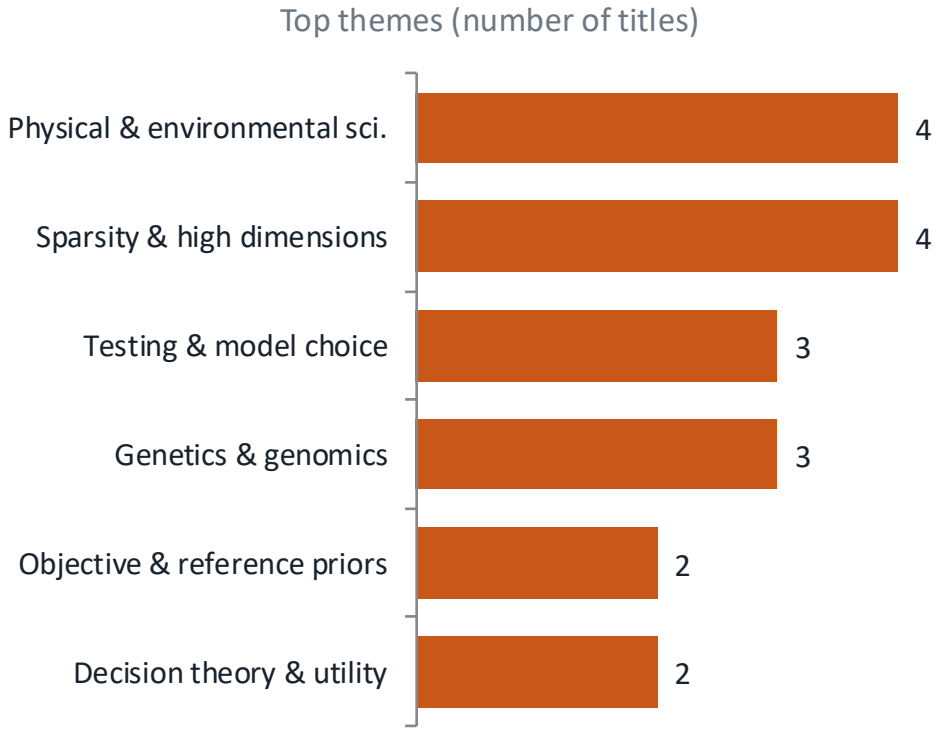


Dirichlet-process and latent-feature nonparametrics, sequential Monte Carlo, nested sampling, objective Bayes and DNA data.

Bayesian Statistics 9 (2011)

Valencia IX · Benidorm, June 3–8, 2010 (joint with the ISBA World Meeting) · 23 papers





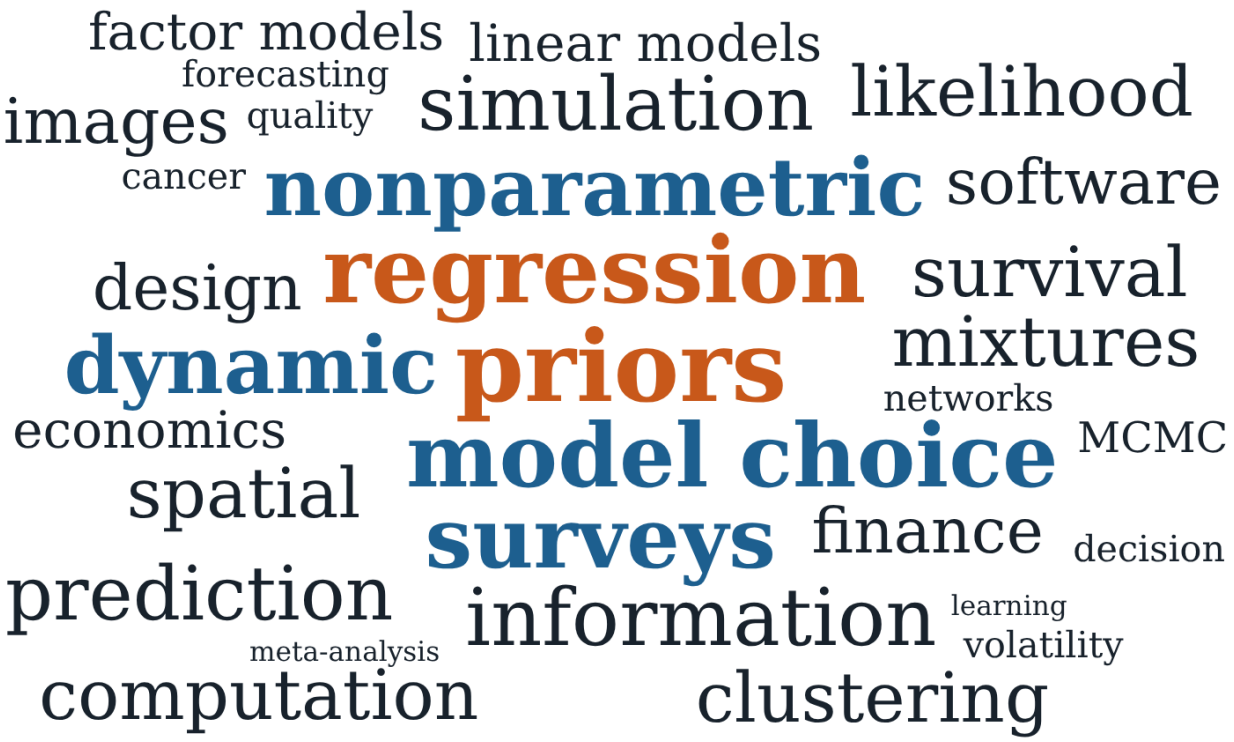
Sparsity and variable selection, particle learning, objective estimation and testing, systems biology and climate.

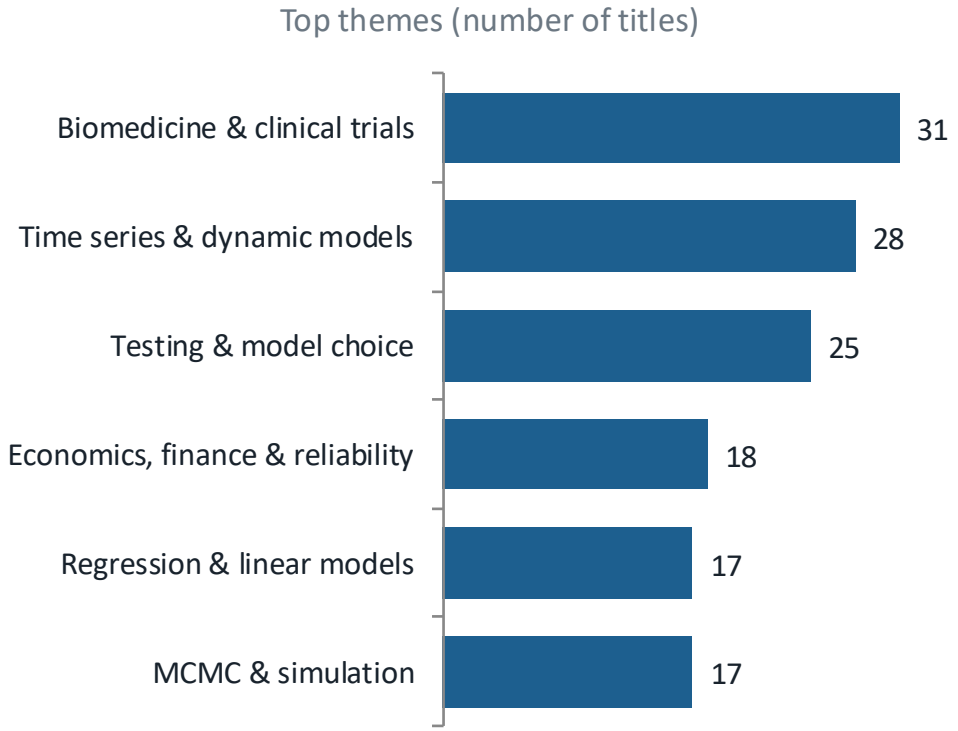
ISBA World Meetings

Crete 2000, Kyoto 2012, Cancún 2014, Edinburgh 2018, Montreal 2022, Venice 2024 and Nagoya 2026: seven programs coded with the same rules

ISBA World Meeting 2000

Hersonissos, Crete, Greece · May 28 – June 1, 2000 · 2 keynote/plenary · 126 invited/special · 78 posters

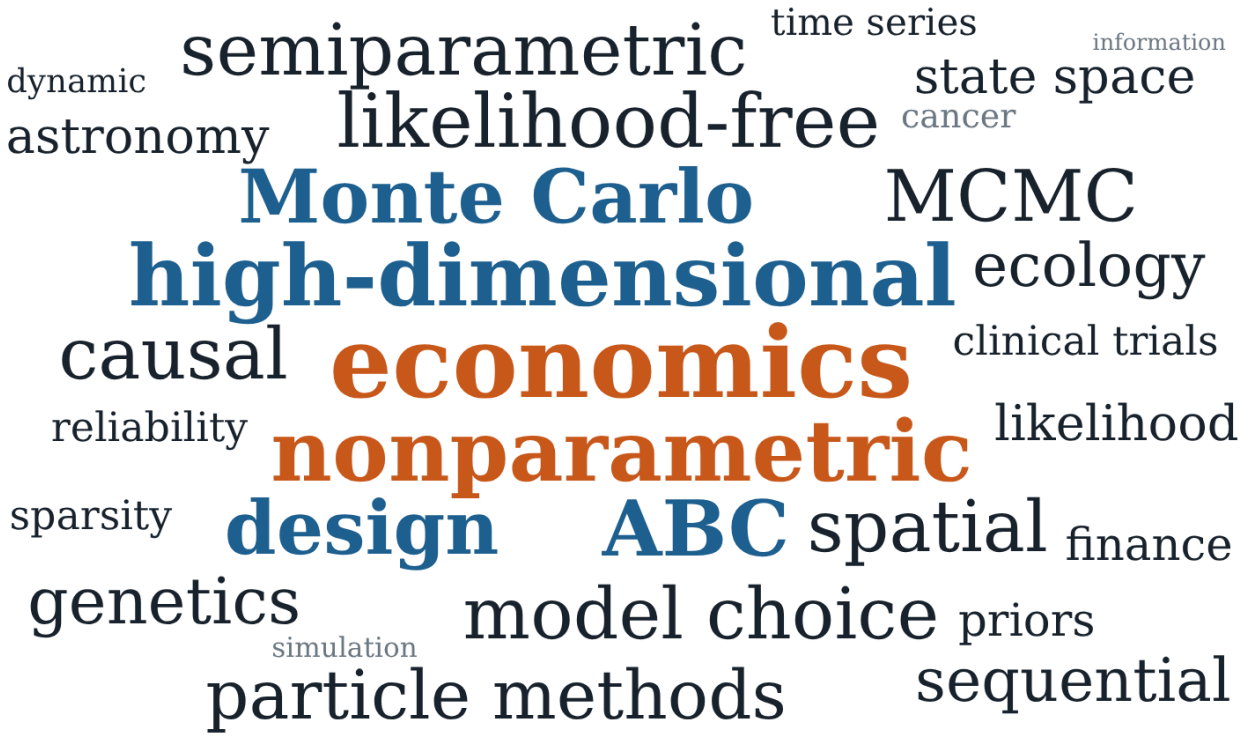


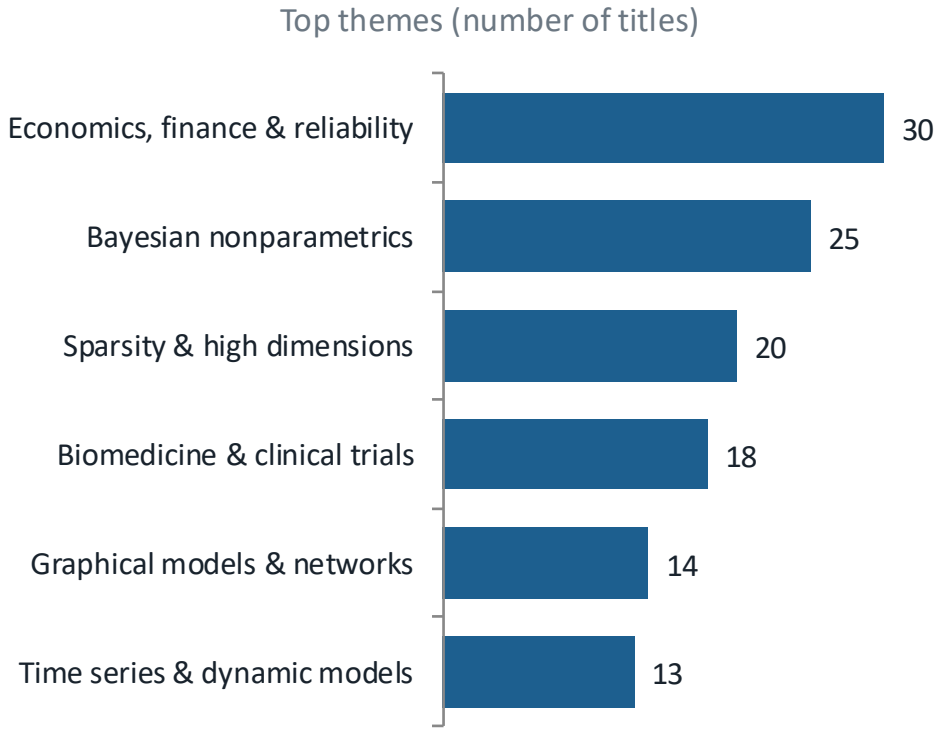


Applications take centre stage: medicine and clinical trials, official statistics, economics and finance, model choice. MCMC and particle methods are everyday tools.

ISBA World Meeting 2012

Kyoto, Japan · June 25–29, 2012 · 9 keynote/plenary · 203 invited/special

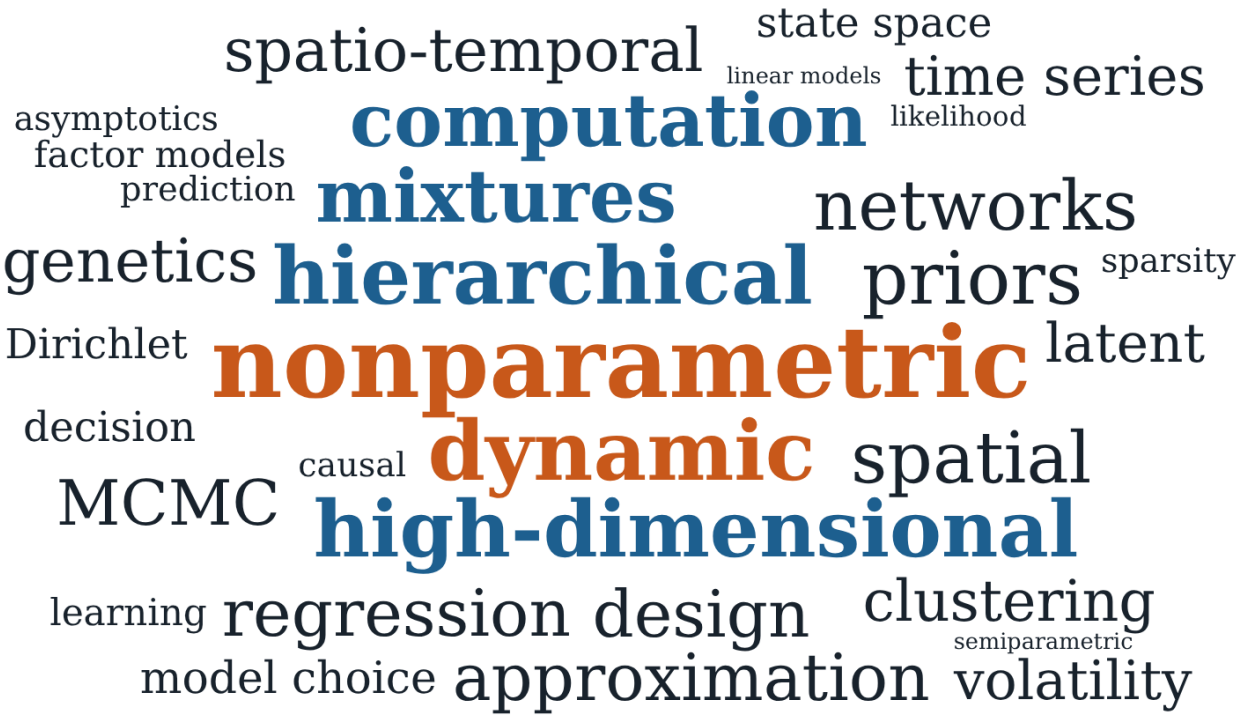


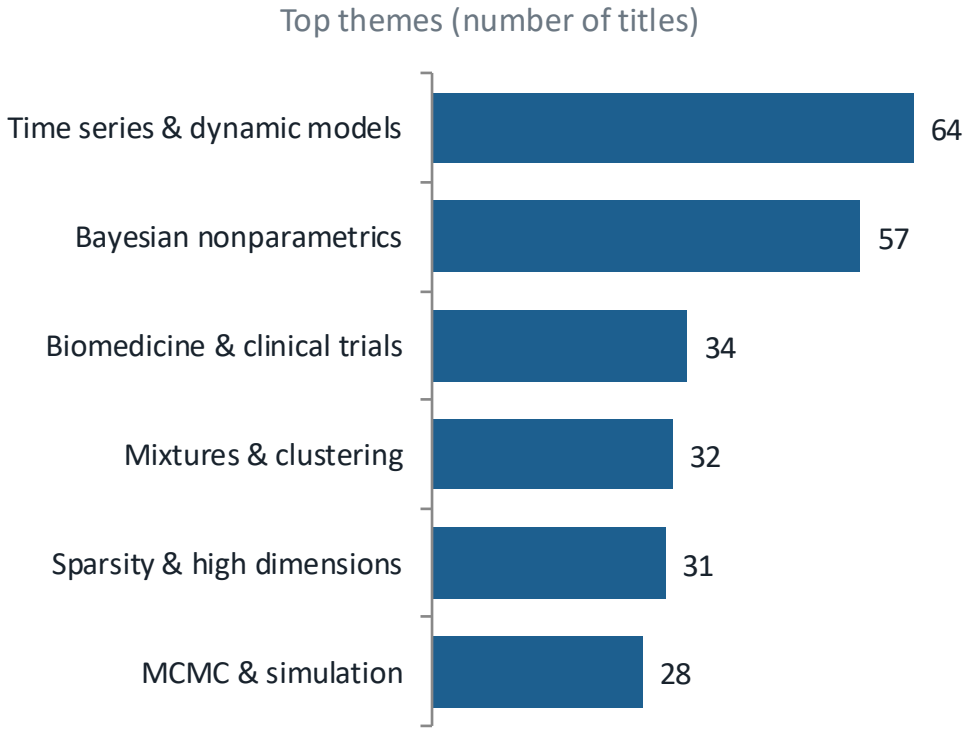


Coded from session titles: econometrics, nonparametrics, high-dimensional inference, ABC and likelihood-free methods, causal inference.

ISBA World Meeting 2014

Cancún, Mexico · July 14–18, 2014 · 10 keynote/plenary · 84 invited/special · 62 contributed · 188 posters

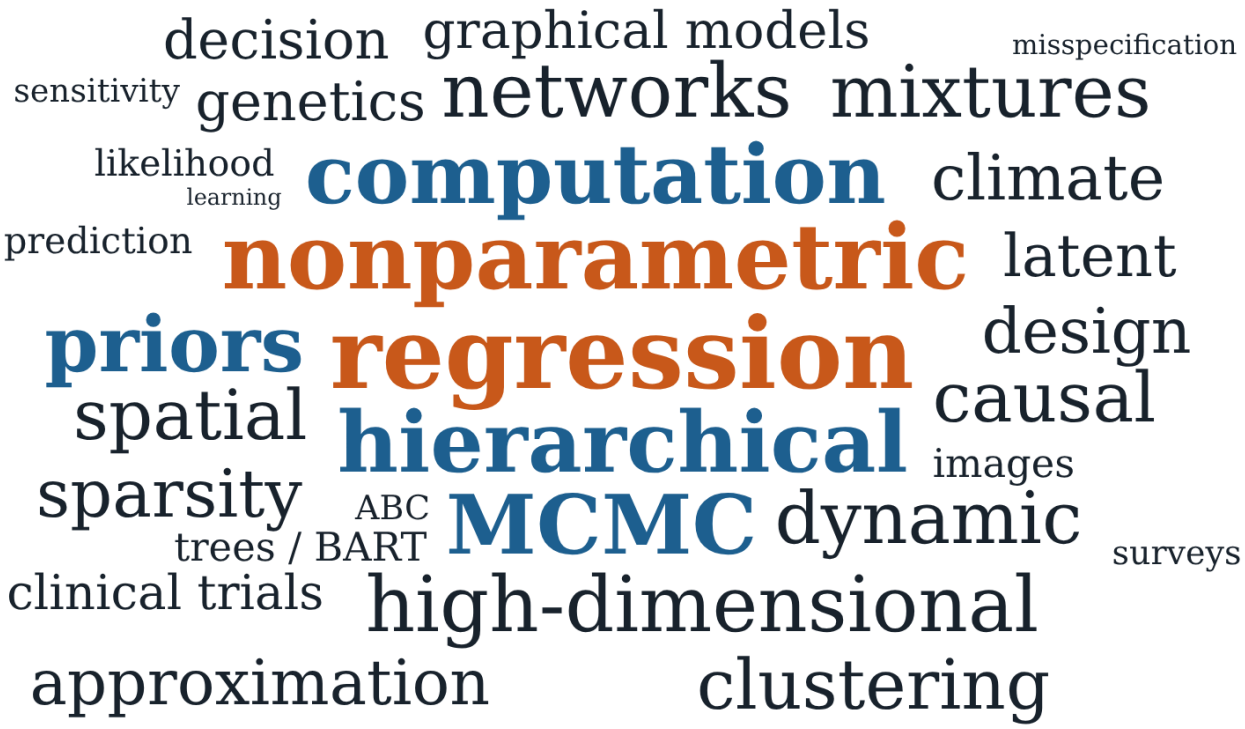


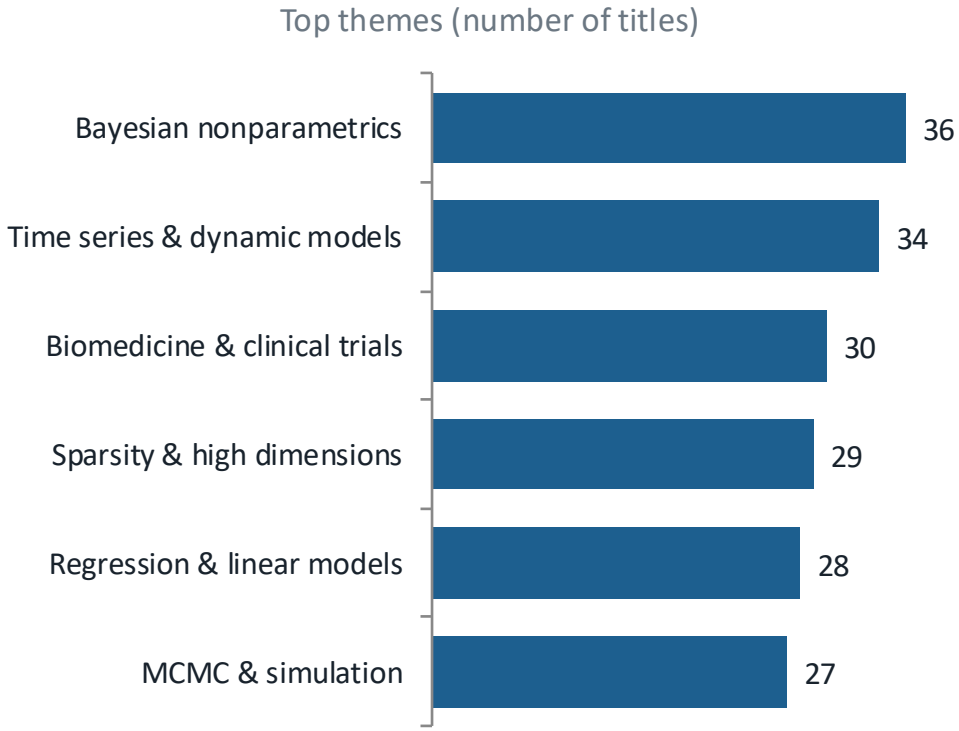


Nonparametrics leads, with dynamic and hierarchical models, high-dimensional inference, mixtures, spatial models and networks.

ISBA World Meeting 2018

Edinburgh, UK · June 24–29, 2018 · 246 oral talks · 65 posters

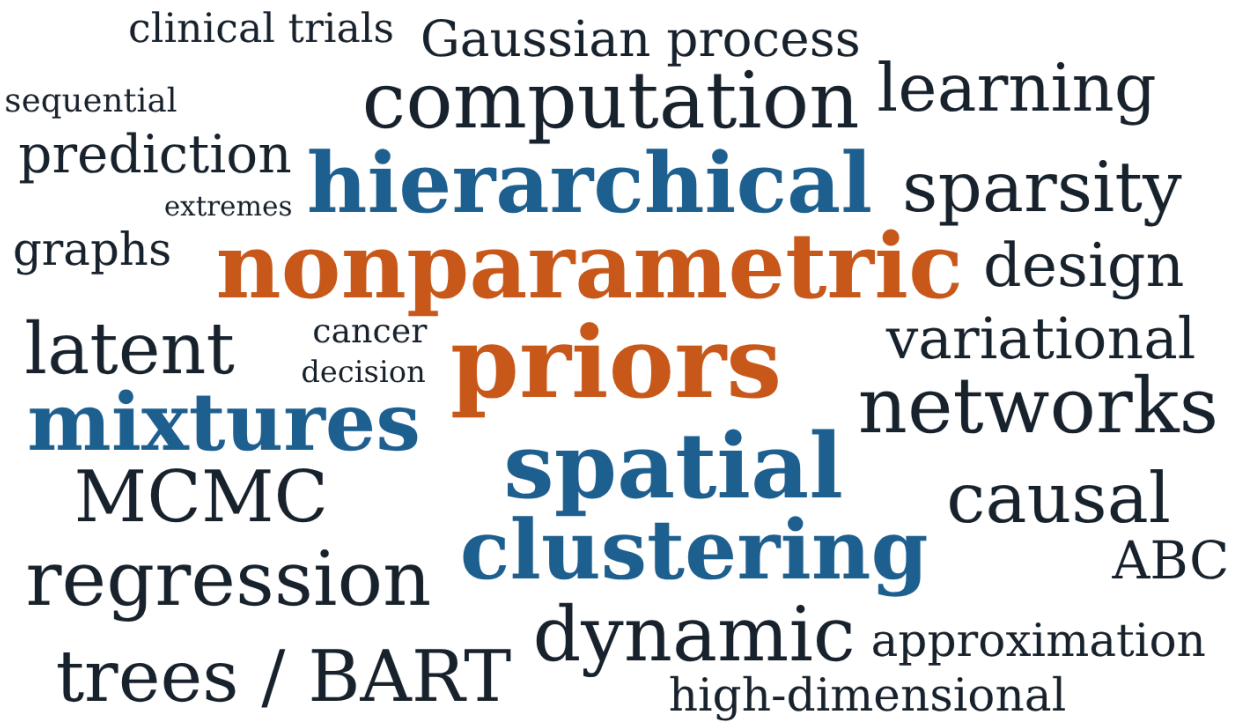


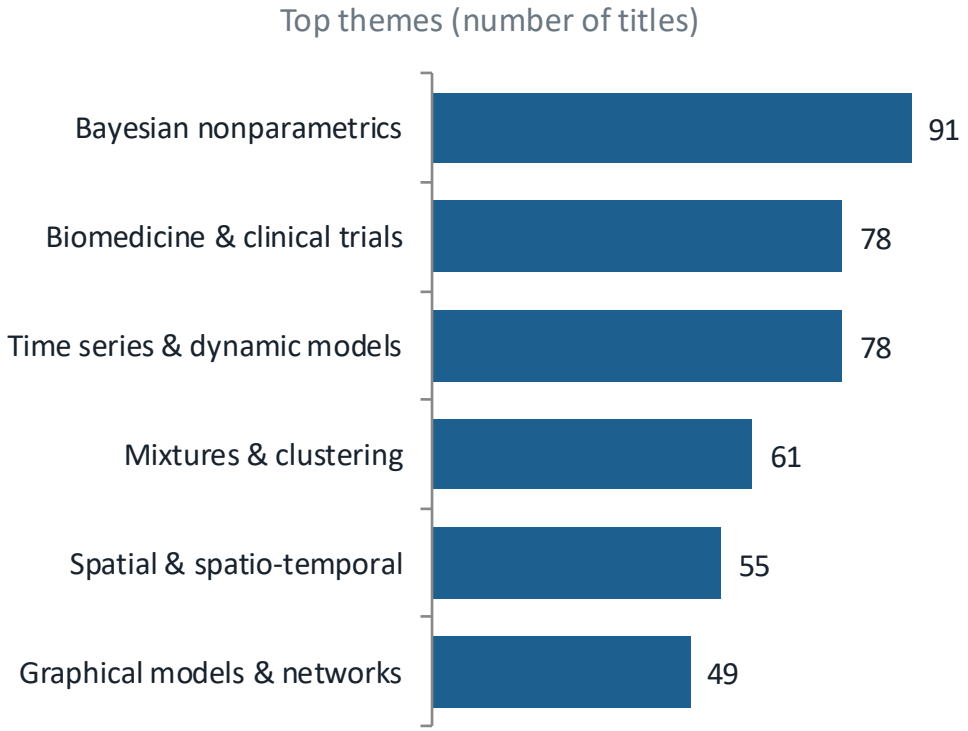


Nonparametrics, time series and biomedicine lead; networks, causal inference, BART and climate rise, and MCMC and scalable computation stay central.

ISBA World Meeting 2022

Montreal, Canada · June 26 – July 1, 2022 · 10 keynote/plenary · 163 invited/special · 71 contributed · 294 posters

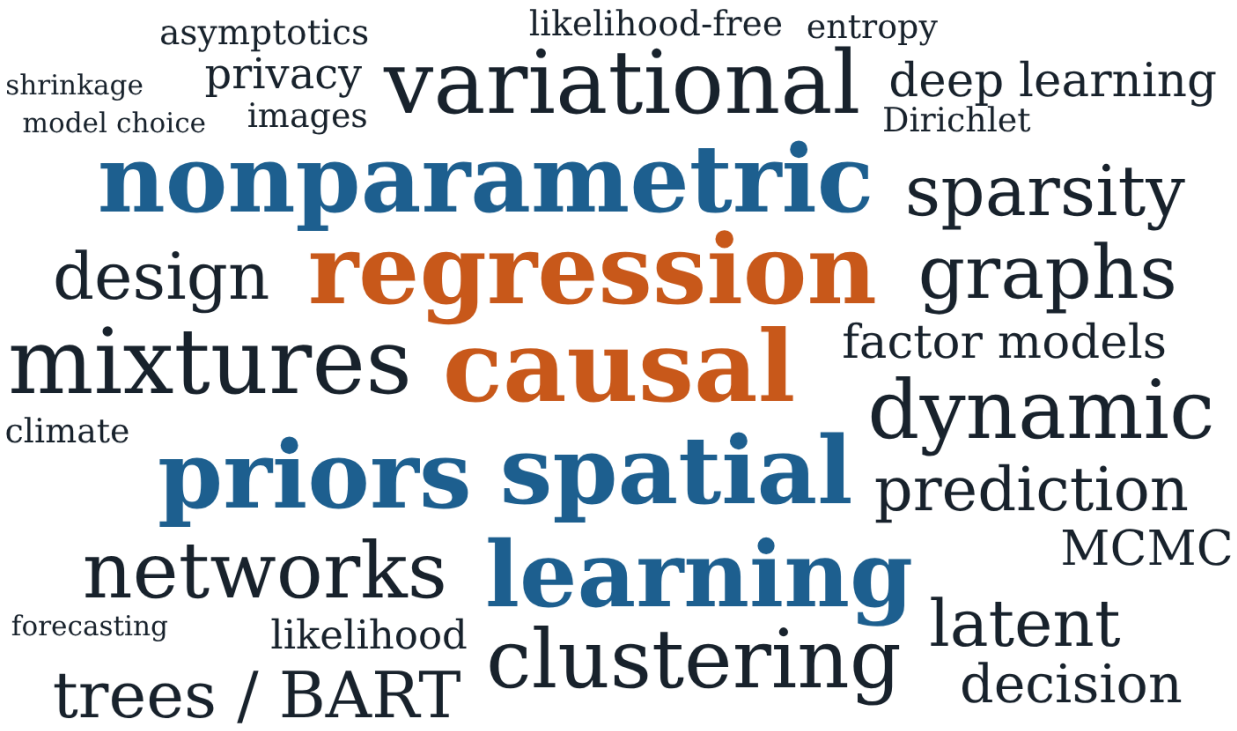


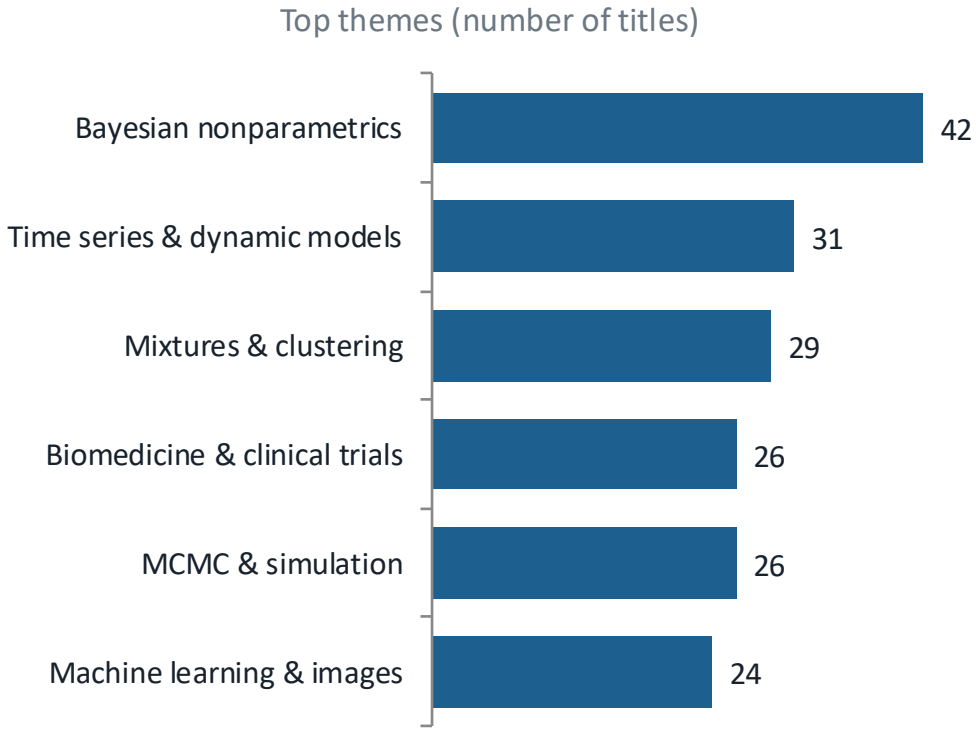


Back in person after the virtual 2021 meeting: COVID-19 and epidemic models lift biomedicine to 15% of titles; nonparametrics, mixtures and spatial models lead, with BART, Gaussian processes and variational methods.

ISBA World Meeting 2024

Venice, Italy · July 1–7, 2024 · 9 keynote/plenary · 171 invited/special · 77 contributed

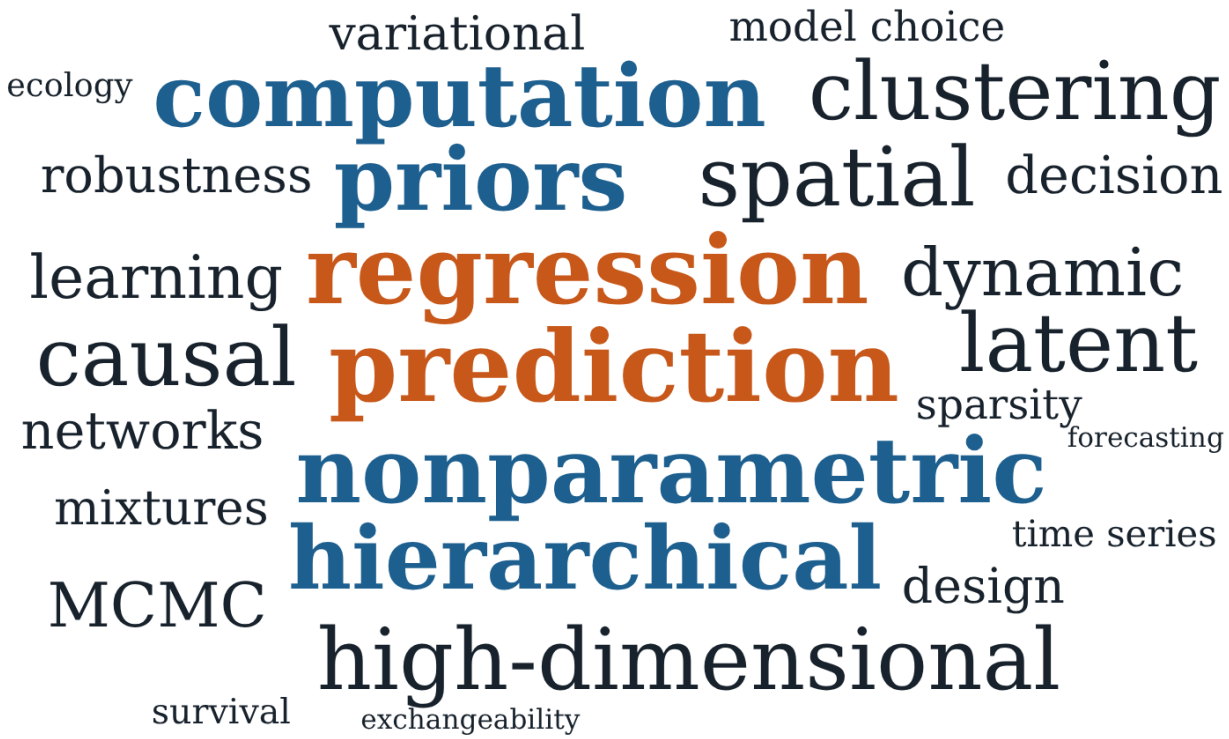


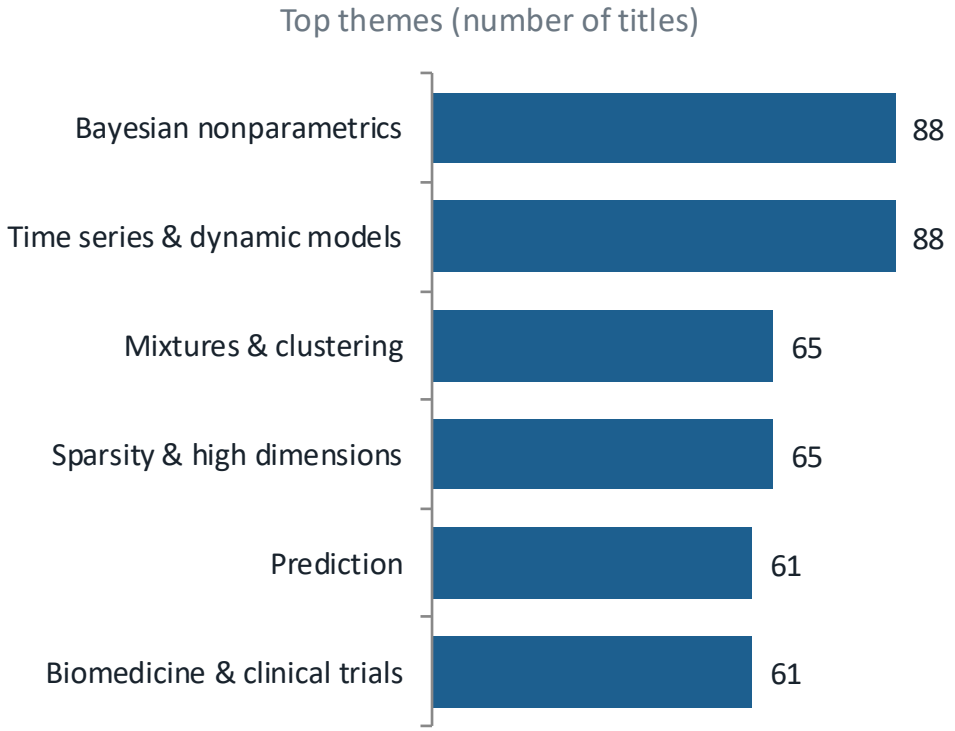


Bayes meets machine learning: causal inference, variational methods, BART and trees, Gaussian processes and deep learning, with nonparametrics and mixtures still on top.

ISBA World Meeting 2026

Nagoya, Japan · June 28 – July 3, 2026 · 11 keynote/plenary · 228 invited/special · 398 posters





The largest program yet: prediction, causal inference, variational methods, BART, latent and network models, with nonparametrics and time series on top.

How the themes were coded, and the limits

1

Sources

Tables of contents of Bayesian Statistics 1–9 (408 papers), and the programs of seven ISBA World Meetings from Crete 2000 to Nagoya 2026 (about 2,500 titles).

2

Coding

Each title is matched against keyword rules for 30 themes, the same for every meeting; a title can carry several. Word clouds count technical terms, dropping generic words like Bayesian and model.

3

Limits

Titles are a coarse signal. Valencia volumes are curated proceedings; ISBA programs are full meetings. Some sources are incomplete: BS2 titles reconstructed, 2012 by session, 2024 without posters, 2018 without talk types.

Pending: scanned contents of BS8 and BS9, to finish page ranges and author lists.

Sources

Bayesian Statistics 1–9, eds. J. M. Bernardo et al. Valencia University Press (1980), North-Holland (1985), Oxford University Press (1988–2011).

ISBA 2000 program and posters: www2.stat.duke.edu/~mw/ISBA2000

ISBA 2012 keynote, invited and special topic sessions: www.omori.e.u-tokyo.ac.jp/ISBA/ISBA2012

ISBA 2014, 2018, 2022, 2024 and 2026 program and abstract books (2018: bayesian.org; 2022: isbawebmaster.github.io/ISBA2022; 2026: isba2026.github.io)

J. M. Bernardo, The Valencia Story; ISBA World Meetings list: bayesian.org