

2023

Awareness



FOCUSED
ULTRASOUND
FOUNDATION

Overview

This chapter includes an overview of the number of presentations and publications that were presented at scientific symposia or journals in 2022. We continue to see growth in the absolute numbers of abstracts and publications, where these abstracts are presented, and new journals publishing focused ultrasound articles. The largest growth of presented abstracts is occurring within the physician specialty societies, and thus indicates a wider exposure of focused ultrasound research and rising levels of interest from practicing clinicians. This is an encouraging trend, and we are hopeful it will lead to increased patient access to the technology in future years.

Additionally, the increasing transparency and openness practices (TOP) within the scientific publishing field are gaining momentum. This means that clinicians and researchers who are new to focused ultrasound have increasing access to the body of focused ultrasound scientific literature—entire articles, not just the abstract. As a result of open access publishing, a simple search allows readers instant access, whereas previously, often the information/full article were restricted behind a pay wall available only to subscribers.

This chapter emphasizes awareness for the scientific community, but we would be remiss if we did not also mention that in May 2022 National Geographic ran a lead story, “New Method Delivers Life-Saving Drugs to the Brain—Using Sound Waves.” The story provides an in-depth look at focused ultrasound for drug delivery, blood-brain barrier opening, and more. It can be found here: nationalgeographic.co.uk/science-and-technology/2022/05/new-method-delivers-life-saving-drugs-to-the-brain-using-sound-waves

VI. Awareness

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Abstracts Presented at FUS Meetings

Meetings	2017	2018	2019	2020	2021	2022
Focused Ultrasound Foundation Symposium, FUSF ¹	–	250	–	257	–	202
International Symposium on Therapeutic Ultrasound, ISTU ²	207	257	197	*	241	281
iTRUSST Focused Ultrasound Neuromodulation	–	–	–	–	60	35
Totals	207	507	197	257	301	518

FUS Abstracts Presented at Other Symposia

Symposium	2017	2018	2019	2020	2021	2022
Acoustical Society of America	48	39	22	13	30	76
American Association for Cancer Research	–	–	–	7	5	7
American Association of Neurological Surgeons ³	–	–	–	–	–	9
American Association of Physicists in Medicine	16	5	7	6	4	3
American Epilepsy Society ³	–	–	–	–	–	7
American Institute of Ultrasound in Medicine	–	9	6	*	5	12
American Society of Clinical Oncology	–	–	–	4	1	–
American Society for Radiation Oncology	5	3	–	2	2	3
American Society for Stereotactic and Functional Neurosurgery	–	6	–	*	–	9
American Urological Association	7	4	16	*	5	13
Biomedical Engineering Society	16	14	26	9	7	1
Cardiovascular and Interventional Radiology Society of Europe	–	–	–	10	8	6
Congress of Neurological Surgeons ³	–	–	–	–	–	7
European Association of Neuro Oncology ³	–	–	–	–	–	3
European Association of Urology	–	–	–	5	6	6
European Conference on Interventional Oncology	–	–	–	–	7	2
European Congress of Radiology	13	22	10	15	2	3

¹ Held biennially

² In 2019 the European Symposium on Focused Ultrasound, EUFUS, combined with the International Symposium on Therapeutic Ultrasound, ISTU and is now held under the title of ISTU.

³ New meetings being followed as of 2022 for focused ultrasound content.

* Cancelled due to COVID-19 pandemic.

FUS Abstracts Presented at Other Symposia continued

Symposium	2017	2018	2019	2020	2021	2022
European Society of Hyperthermic Oncology ³	–	–	–	–	–	9
IEEE International Engineering in Medicine and Biology	5	11	11	2	2	1
IEEE International Ultrasonics Symposium	71	19	49	57	72	45
International Skeletal Society ³	–	–	–	–	–	1
International Bubble Conference ³	–	–	–	–	–	2
International Society for Magnetic Resonance in Medicine	–	–	–	33	12	32
International Stereotactic Radiosurgery Society ³	–	–	–	–	–	6
Japanese Society for Therapeutic Ultrasound	39	35	48	52	*	–
Korean Society for Therapeutic Ultrasound	15	17	22	6	–	29
Radiological Society of North America	17	14	26	7	4	26
Society for Thermal Medicine	10	10	9	*	5	10
Society of Interventional Radiology	2	1	5	*	3	21
Society of Neuro-Oncology ³	–	–	–	–	–	10
Society of Pediatric Interventional Radiology ³	–	–	–	–	–	2
Taiwan Associated of Interventional Therapeutic Ultrasound	–	–	12	5	9	8
World Society for Stereotactic and Functional Neurosurgery ³	–	–	–	–	–	25
Totals	243	260	222	273	189	394

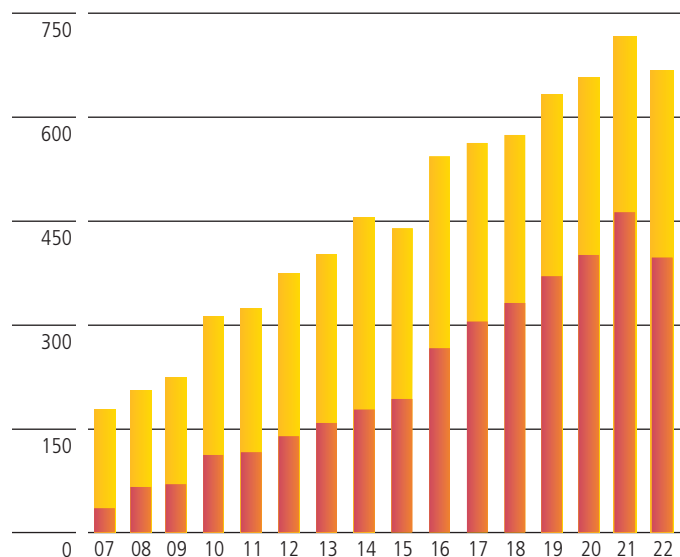
In 2022 abstracts presented at scientific meetings rebounded to growth similar to pre-pandemic levels. This year we started tracking 12 new meetings. 81 abstracts presented at these scientific meetings along with 313 abstracts at other symposia and an additional 518 abstracts as focused ultrasound specific meetings leads to a whooping total of 912 abstracts. The largest growth in abstracts is happening in physician specialty societies. This tracks well with our noted transition of the field from preclinical to first-in-human research.

³ New meetings being followed as of 2022 for focused ultrasound content.

* Cancelled due to COVID-19 pandemic.

FUS Publications*

Traditional journals Open access



* New source in 2022: Web of Science Core Collection as of February 14, 2023

FUS Publications and Citations*

Cumulative

8,377

FUS publications

234,640

Citations of FUS publications

2022

677

FUS publications

26,848

Citations of FUS publications

* New source in 2022: Web of Science Core Collection as of February 14, 2023

Readers will note that our numbers for publications and citations have changed from last year's report. This year we used a new indexed data source, Web of Science Core Collection, while reports from previous years were restricted to search in the Medline database.

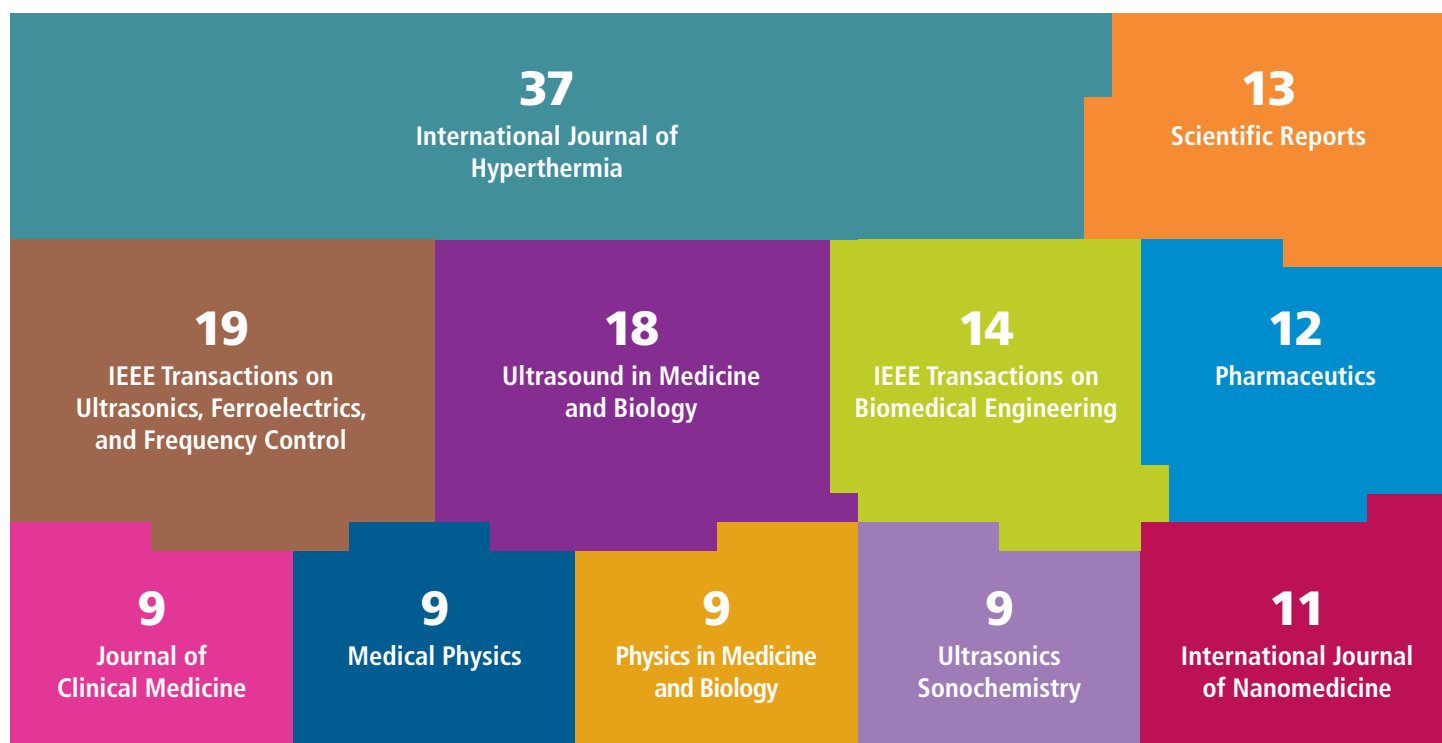
Publications—Cumulative Top Twenty-five Source Titles

Records	Scientific publication titles
577	Ultrasound in Medicine and Biology
336	International Journal of Hyperthermia
277	IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control
257	Physics in Medicine and Biology
185	Journal of the Acoustical Society of America
164	Medical Physics
151	Ultrasonics
143	Journal of Controlled Release
143	Scientific Reports
135	Magnetic Resonance in Medicine
120	Ultrasonics Sonochemistry
111	IEEE Transactions on Biomedical Engineering
108	Japanese Journal of Applied Physics
96	Plos One
73	European Radiology
73	Radiology
71	Journal of Neurosurgery
70	Theranostics
68	Journal of Ultrasound in Medicine
61	Journal of Urology
60	Journal of Magnetic Resonance Imaging JMRI
58	BJU International
55	Journal of Endourology
53	Applied Physics Letters
51	European Urology

* New source in 2022: Web of Science Core Collection as of February 14, 2023

Of interest, the Transparency and Openness Promotion, TOP, scores for the journals on our list of 2022 top source titles, page VI.7, have increased significantly in several journals. We are hopeful this trend will continue as we strongly believe open science practices are good for the focused ultrasound research community.

Publications—2022 Top Source Titles



Publications—2022 Top Source Titles

Records	Impact factor	TOP score '21	TOP score '22	Scientific publication titles
37	3.8	1	4	International Journal of Hyperthermia
19	3.3	1	1	IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control
18	3.7	2	4	Ultrasound in Medicine and Biology
14	4.8	0	0	IEEE Transactions on Biomedical Engineering
13	5.0	13	14	Scientific Reports
12	6.5	9	9	Pharmaceutics
11	7.0	3	3	International Journal of Nanomedicine
9	5.0	—	10	Journal of Clinical Medicine
9	4.5	1	1	Medical Physics
9	4.2	1	2	Physics in Medicine and Biology
9	9.3	1	2	Ultrasonics Sonochemistry

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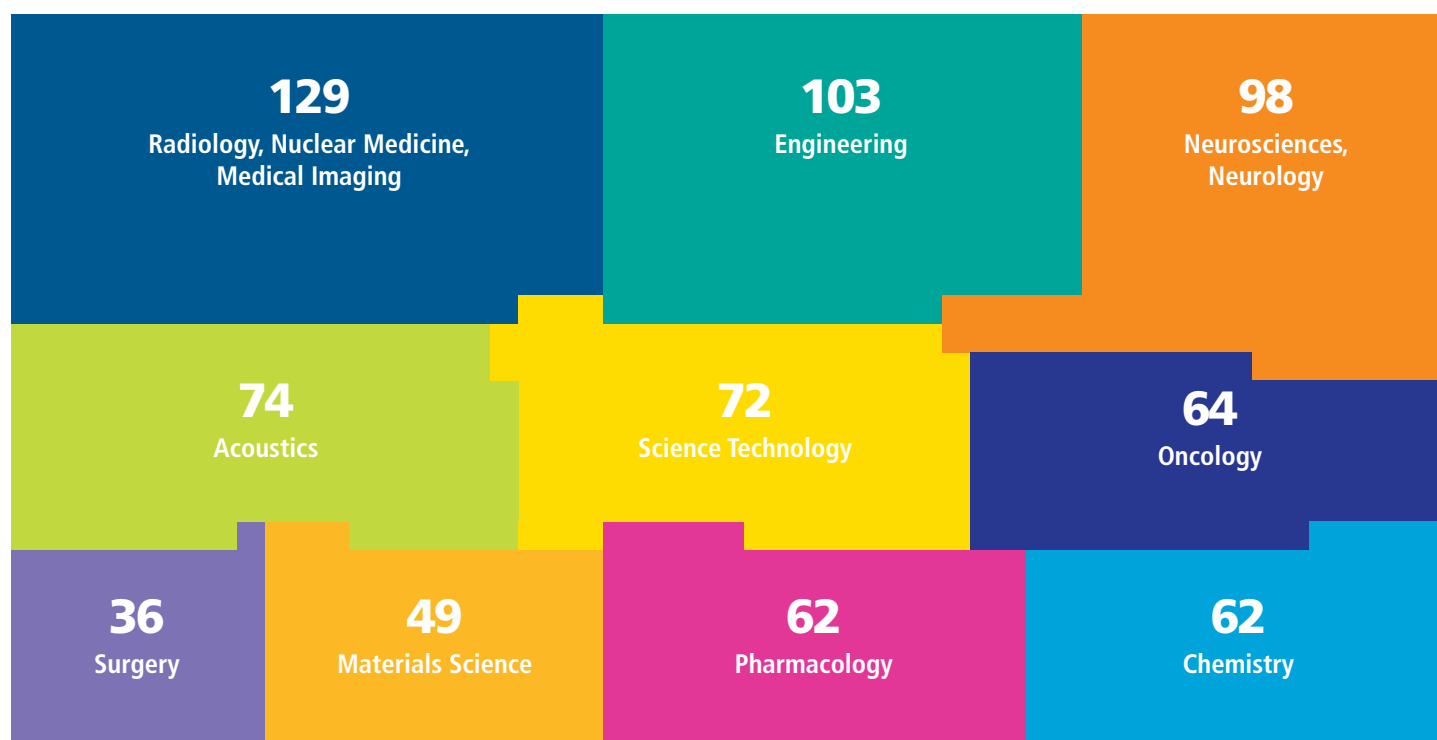
* New source in 2022: Web of Science Core Collection as of February 14, 2023

Publications—Cumulative Top Twenty-five Research Areas

Records	Scientific research areas
2659	Radiology, Nuclear Medicine, Medical Engineering
1551	Acoustics
1226	Engineering
749	Oncology
650	Science Technology
644	Neurosciences, Neurology
627	Chemistry
521	Physics
503	Surgery
479	Urology, Nephrology
431	Materials Science
405	Pharmacology
304	Research, Experimental Medicine
204	Obstetrics, Gynecology
200	Biochemistry, Molecular Biology
188	Audiology, Speech Language, Pathology
716	Dermatology
168	Cardiology
132	Computer Science
131	General Internal Medicine
115	Optics
111	Biophysics
101	Instrumentation
86	Biotechnology, Applied Microbiology
67	Cell Biology

* New source in 2022: Web of Science Core Collection as of February 14, 2023

Publications—2022 Top Ten Research Areas



Publications—2022 Top Ten Research Areas

Records	Scientific research areas
129	Radiology, Nuclear Medicine, Medical Imaging
103	Engineering
98	Neurosciences, Neurology
74	Acoustics
72	Science Technology
64	Oncology
62	Chemistry
62	Pharmacology
49	Materials Science
36	Surgery

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* New source in 2022: Web of Science Core Collection as of February 14, 2023