THE SOCIETY FOR ORGANIC PETROLOGY

NEWSLETTER

Vol. 40, No. 1 March 2023 ISSN 0743-3816

The 2023 Joint 74th ICCP and 39th TSOP Meeting

Conference & Cultural Center of the University of Patras, Rio-Patras, Greece

photo from https://epay.upatras.gr/2023-joint-74th-iccp-and-39th-tsop-meeting/

17th – 24th September 2023, Greece

2023 Joint 74th ICCP and 39th TSOP Meeting

Meeting website is available now: **https://www.iccop.org/meetings/joint-74th-iccp-and-39th-tsop-meeting/**

Organizing Committee: Kimon Christanis (chair), Stavros Kalaitzidis (executive secretary), Andreas Georgakopoulos, Nikolaos Pasadakis, Aristofanis Stefatos, Ioannis Oikonomopoulos, Dimitrios Rallakis, Stefanos Papazisimou, Nikolaos Koukouzas, Markos Xenakis

Abstract deadline: 15th June 2023

Short Course: 18th September 2023

Technical Sessions:19-22 September 2023

Field Trip: 23-24 September 2023

Registration is open now: https://epay.upatras.gr/2023-joint-74th-iccp-and-39th-tsop-meeting/

For any questions and queries email: skalait@upatras.gr

The Society for Organic Petrology

TSOP is a society for scientists and engineers involved in coal petrology, kerogen petrology, organic geochemistry, and related disciplines. The Society organizes an annual technical meeting and field trips; sponsors research projects; provides funding for graduate students, and publishes a website, Facebook Page, quarterly newsletter, annual meeting program and abstracts and special publications. Members are eligible for discounted subscriptions to Elsevier journals ***International Journal of Coal Geology*** and ***Review of Palaeobotany and Palynology***.

The Society for Organic Petrology Newsletter
(ISSN 0743-3816) is published quarterly.

GUIDELINES:
The TSOP Newsletter welcomes contributions from members and non-members alike. Readers are invited to submit items pertinent to TSOP members' fields of study. These might include meeting reports and reviews, book reviews, short technical contributions including those on geologic localities or laboratory methods, as well as creative works such as poems, cartoons and works of fiction. Photos, graphs and other illustrations are welcomed. Low-resolution images are discouraged, as they cannot be reproduced well in print. Articles are preferred in Microsoft Word, RTF or plain text formats.

Contact the Editor:
Biao Fu: editor@tsop.org

Membership Information:
Please report any changes in address or contact information to Brett Valentine, TSOP Membership Chair:
bvalentine@usgs.gov

Members can also update their own information by logging into the secure TSOP website:
www.tsop.org/mbrsonly/

The TSOP Newsletter is published quarterly by The Society for Organic Petrology and is distributed to all Society members as a benefit of membership.

Membership in the Society is open to all individuals involved in the fields of organic petrology and organic geochemistry. For more information on membership and Society activities, please see: www.tsop.org

For purposes of registration of the TSOP Newsletter, a permanent address is:
The Society for Organic Petrology
c/o American Geological Institute
4220 King St., Alexandria,
VA 22302-1520 USA

Newsletter Submission Deadlines

December Issue: Dec. 10th, 2023
March Issue: March 10th, 2023
June Issue: June 10th, 2023
September Issue: Sept. 10th, 2023

Table of Contents

Dear TSOP Members,

We are already a quarter of the way through 2023 and I trust that it has been productive for you thus far!

As part of TSOP Council's efforts to address a progressive decline in our membership, we recently hosted our first online seminar for the year. We would like to thank the presenter, previous John Castano Honorary Membership Award recipient, and celebrated scientist, author and esteemed member of the geoscience community, Prof. Maria Mastalerz from Indiana University. Her talk, titled 'My adventure with organic petrology', was an engaging and heartfelt account of her upbringing and the arduous journey and challenging circumstances she faced to build her outstanding career. Her talk was recorded will be available on TSOP's new YouTube channel for viewing, with links available on the TSOP website. Further communication about upcoming seminars will be sent out in the coming months.

The website and registration portal for the Joint 74th ICCP and 39th TSOP Meeting are now fully operational and the committee are accepting abstracts and processing registrations. I encourage you to visit the page and publicise the event widely, and would like to commend the organising committee on the progress made and for the exciting program of events.

To add to this excitement, TSOP Council has also received and approved a proposal for the 2024 annual meeting which will be held in Ulaanbaatar, Mongolia.

I would like to remind all members that during this time of the year TSOP's award committees are fully immersed in the candidate review and selection process. This is a great opportunity to recognise achievements of fellow researchers and I urge you to reach out to committee chairs should you wish to submit a nomination.

With the Easter break coming up I hope you and your loved ones are able to spend some quality time together, albeit short, and I look forward to engaging with TSOP family during online meetings and hopefully in Greece.

Best wishes,
Kaydy Pinetown, TSOP President 2021-2023

TSOP Membership Dues

TSOP dues payments are due on or before **December 31st each year.** We encourage you to check your dues status and make your payment so that you can continue your TSOP membership and support the society and its work.

TSOP dues are currently set at:

Individuals:

- $25 per year or
- $100 for 5 years (5 years for the price of 4!)

Students:

- $15 per year

Institutional/Corporate:

- $75 per year

You can use our convenient online dues payment system to pay dues by credit card. You can login at the Members Only TSOP website and select 'Online dues payment' or go to www.tsop.org/dues and access the online form without logging in.

Thank you for your interest and support of TSOP and we look forward to a renewal of your TSOP membership.

TSOP is an AAPG Affiliated Society.
Abstracts from annual meetings are available through **AAPG Datapages**

Find us on Facebook

www.facebook.com/OrganicPetrology

Join TSOP's growing community of professionals, researchers, and students on **LinkedIn:** **https://www.linkedin.com/groups/12634595/**

2023 TSOP Online Seminar (Series I)

– presented by Prof. Maria Mastalerz

TSOP council have plans for hosting a series of online seminars during 2023. It is a pleasure to invite Prof. Maria Mastalerz from Indiana Geological Survey of Indiana University to be our first invited speaker. Dr Mastalerz is a celebrated scientist, author and member of the geoscience community. She presented a wonderful talk titled ‘‘My adventure with organic petrology’ on March 16th of 2023. Maria have built an outstanding career over the past years. She shared her personal precious working experiences and views on organic petrology. The online talk was very successful and attracted more than ninety colleagues and friends worldwide to participate. On behalf of TSOP Council and our membership, we wish to thank Maria for her time spent on preparing the talk and the enthusiasm and sincerity with which it was delivered. The whole talk was recorded by Agnieszka Drobniak, and now is available on TSOP’s new YouTube channel (https://tsop.org/photos.html). Welcome to view the video if you unable to join the online seminar and share it to colleagues who might have interests.

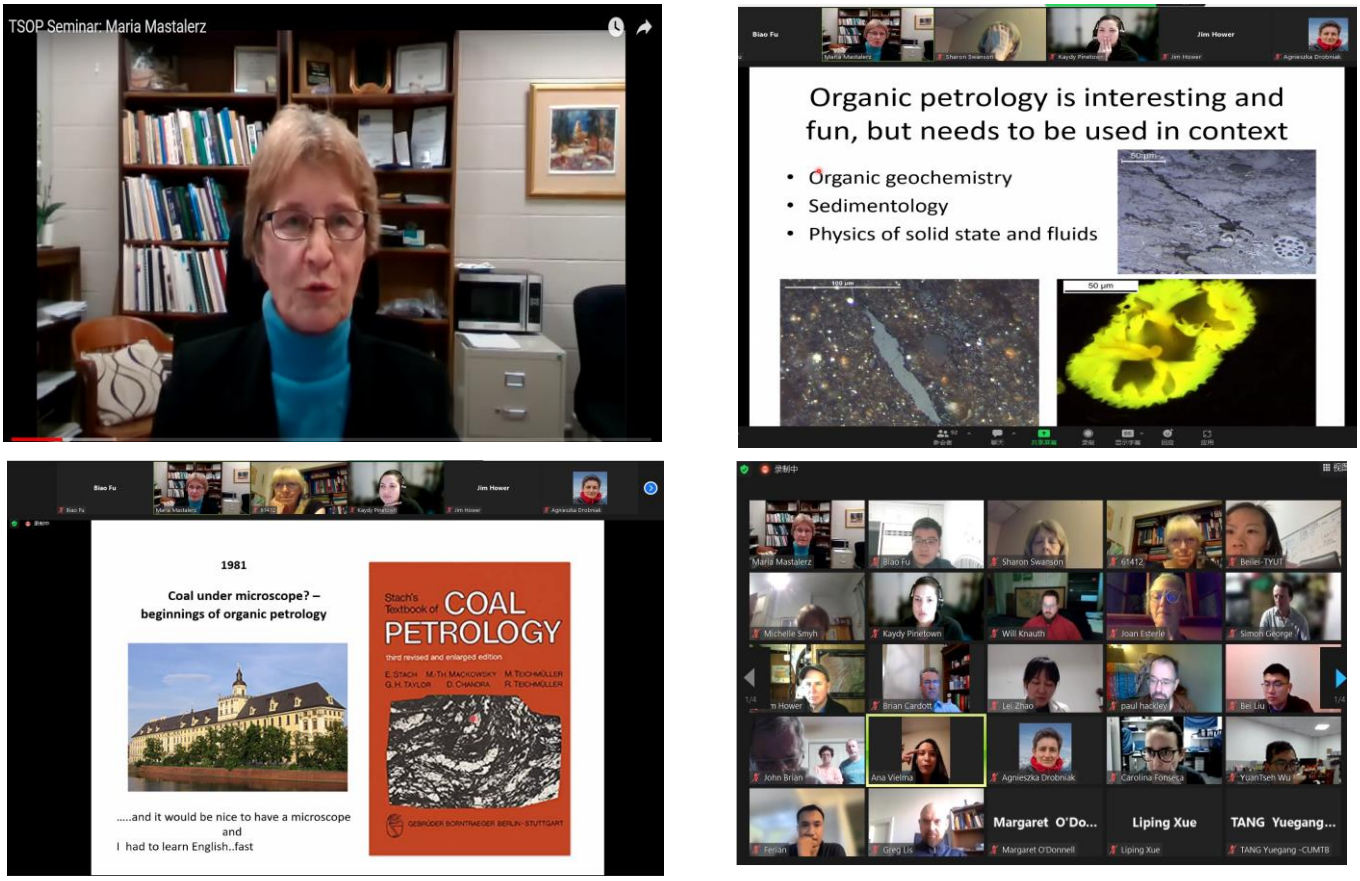


Figure. Screen shot of the TSOP online seminar.

The TSOP Research Committee

A holistic view of organic petrology is that we are looking at the whole rock with a wide variety of tools, not just the microscopes of traditional organic petrology.In addition to the traditional microscopy, the upper-left corner of our logo, our science involves chemistry (the bottom-right corner), mineralogy, and a broad spectrum of other tools. We are not only looking at the coal and source rocks, but we are also looking at the products from those raw materials, and other applications of organic petrology beyond traditional geology and the energy industry. That could be fly ash, coke, advanced carbon materials, critical elements, among other things. Recognizing the breadth of our science is the way that we both preserve our science and grow our membership in the face of the decline of the traditional coal industry and, sooner or later, the oil and gas industry.

With its founding from the base of the loosely organized North American Coal Petrographers in 1983 (https://www.tsop.org/history.html), TSOP is now 40 years old. If you were not at the early TSOP meetings, look at the abstracts from the 1984 conference. While, all things considered, many of the concepts discussed in 1984 have stood the test of time, our tools are much more advanced today. Just as one example, ICP-MS, a fundamental tool in inorganic geochemical studies, was not yet in commercial production in the early 1980's. Just as important as our new and improved instruments, our studies are built upon the foundations of the past 40 years and more just as the scientists speaking at the first TSOP meeting were building on the foundation of the work that had preceded them.

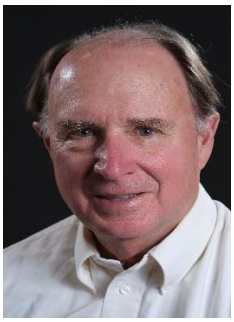
As the Research Committee, we seek to encourage people to think about how different our science is compared to 1983, the year of TSOP's founding, and also think about what our organization and our science might look like in another 40 years. Even if we are not active in 40 years (and even the committee chair expects to hit a wall before then), we trust that our students or the students of our students will be doing research. What we are doing now will establish the foundation upon which the current and future generations of organic petrographers will build their science.

It is the committee's mandate (https://www.tsop.org/research_committee.html) to "oversee and supervise work on TSOP-sponsored research projects," so, we are looking to the TSOP membership to guide us towards appropriate projects. Such projects could be strictly internal to TSOP or collaborative with another organization, such as ICCOP or AAPG's Energy Minerals Division. Both of these groups have been part of successful partnerships with us in the past and are potential collaborators on new projects. So, in addition to proposing TSOP-sponsored research, we invite you to share something about your own research. Not necessarily the details about results, those belong in peer-reviewed journals, but perhaps something about the interaction of the techniques with the materials. For example, applications of traditional microscopy to advanced carbon materials or the use of electron microscopy in the search for critical elements in coals. We look forward to learning of your progress.

Meanwhile, below you will find short biographies of the members of the committee. Some of us you will know personally or, perhaps, just through our publications. Collectively, we represent a cross section of the research being done by TSOP.

Jim Hower
Chair of the Research Committee

Introduction to the 2023 TSOP Research Committee



Jim Hower received his BA, MS, and PhD degrees in geology from Millersville University, Ohio State, and Penn State. He has been a scientist at the University of Kentucky's Center for Applied Energy Research (CAER) since 1978 and has been an adjunct professor and, later, a Research Professor in the University of Kentucky Department of Earth & Environmental Sciences since 1981 with a research focus on a broad range of topics within coal and fly ash petrology and chemistry. As of 30 June 2021, Jim retired from the university. Finding that retirement is a speedbump and not a wall, he remains active at the CAER and elsewhere. He has authored more than 500 publications in more than 120 journals and books. Jim was the editor of International Journal of Coal Geology and Coal Combustion & Gasification Products for 10 years each and is a co-author of the book Inorganic Chemistry of Coal (spring 2023). Jim has received the top awards from The Society for Organic Petrology, International Committee for Coal & Organic Petrology, and the Geological Society of America's Energy Geology Division. In addition, he was a fictional coal geologist in Karen Rose Cercone's 1999 mystery novel, Coal Bones.

Nikki (Nicola) Wagner is the Director of the DSI-NRF Centre of Excellence in Integrated Mineral and Energy Resource Analysis (CIMERA) and Professor in the Geology Department at the University of Johannesburg, Johannesburg, South Africa. Her research areas include organic petrology, coal petrography, trace elements and critical raw materials in coal and associated products, coal geology, carbon dioxide capture and storage, coal oxidation, underground coal gasification, coal conversion, ash utilization, and so on. She graduated from RHBNC, London, with a geology-zoology Honors degree and completed her PhD in 1998 (Witwatersrand). Shortly thereafter, Dr Wagner worked for Sasol in their Coal to Syngas Research Group, as the in-house coal petrographer. Prof Wagner joined the School of Chemical and Metallurgical Engineering at the University of the Witwatersrand, Johannesburg, in 2006, where she ran the Coal Research group for 8 years before moving back into geology at the University of Johannesburg in 2014. Prof Wagner has over 70 peer reviewed publications and produced a book on coal petrology. She has graduated over 45 postgraduate students and is an active peer reviewer for over 10 research journals; is accredited by the International Committee for Coal and Organic Petrology (ICCP); and is the elected editor of the ICCP News, where she also serves on the Council. Prof Wagner is a Fellow of the Geological Society of South Africa (GSSA); member of the FFF-C, SEG, and SACNASP; and has a B NRF rating. Prof Wagner has three children.

Biao Fu is a research professor at Zhengzhou University at the Critical Metals Lab of Zhengzhou University, Henan Province, China. Before that, he worked as a postdoctoral researcher in the State Key Laboratory of Coal Combustion at Huazhong University of Science and Technology. He received his Ph.D. degree in Environmental Science and Engineering in 2019 from the University of Science and Technology of China. His main research field includes coal combustion; coal and ash petrology/ mineralogy/geochemistry; the recovery of critical metals from solid wastes, especially coal-based materials; and heavy metals control techniques during solid fuel incineration. Over the past years, he has published more than 40 peer review articles in this area and serves as a reviewer for more than ten international journals. He is the editor of TSOP Newsletter.

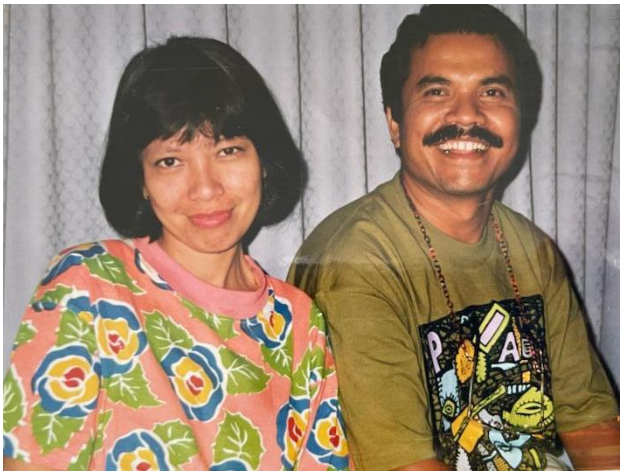
Binoy K. Saikia is Principal Scientist & Head of Coal & Energy Division at CSIR-North East Institute of Science and Technology, Jorhat, Assam, India. He received his MSc (Chemistry) and PhD (chemistry) in 2001 and 2008, respectively. He is among top Energy scientists (as recognized by Stanford) and among the top Asian scientists in 2021 and is a fellow of the Indian Institute of Chemical Engineers, the Geological Society of India (FGS), and the Mining Geological and Metallurgical Institute of India (MGMI). In addition to several awards from professional societies, Binoy was the 2021 the recipient of “Shanti Swarup Bhatnagar Prize”, the highest Indian science award, for outstanding contributions in the field of science and technology. Dr Saikia’s contributions are primarily on alternative utilization of Indian low-grade coal resources for their value addition leading to the economic benefit of the country in addition to research on carbon chemistry, atmospheric chemistry, and energy & environmental chemistry. He has more than 140 peer-reviewed research publications and five patents, including an Indian and US patent to produce blue-fluorescent carbon quantum dots (CQD) from Indian subbituminous coal. He is also associated with many science journals as a reviewer and special-issue editor and serves as the Editor of International Journal of Coal Science & Technology and as a Guest Editor of International Journal Oil, Gas and Coal Technology. His path-breaking interdisciplinary R&D on bulk production of CQDs from coal provides an alternative and new avenue for the economic aspect of sustainable utilization of abundant coal feedstock.

Michelle Johnston is currently an independent contractor based in Colorado providing organic petrography services, primarily within the oil and gas sectors, with areas of experience in dispersed organic matter and coal geology, coal petrology, and organic petrology. She received her Bachelor’s in Biology with a minor in Environmental Science from Bellarmine University in 2011, and her Master’s in geological sciences with a focus in organic petrography from the University of Kentucky in 2013. While in Graduate School, she was an Antoniette Lierman Medlin Award recipient in 2012 from the Geological Society of America Coal Geology Division for her work in petrographic assessments of Eastern Kentucky coals. During this time, Michelle was also a visiting organic petrography student at the University of Witwatersrand in Johannesburg, South Africa, assisting with organic matter characterization for efficient coal utilization in association with Dr. Nikki Wagner. Immediately following graduation, Michelle worked as an organic petrographer for the Center of Applied Energy Research as a Vitrinite Reflectance analyst, as well as co-project contributor and organic petrographer for Morehead State University’s EPSCoR-funded project examining microbial diversity in Cenozoic lignite coals for the Department of Physics, Earth Science and Space Systems Engineering. She joined ConocoPhillips, LTD. in 2014 as an in-house organic petrographer conducting organic matter characterization, thermal maturity analyses, and organic petrography-geochemistry integration for unconventional source systems for seven years.

Passing of a Splendid Geologist: Chairul Nas

Dr Chairul Nas, one of the most well known geologists in Indonesia, passed away on the 18th of December 2022. Not only was Chairul a treasure trove of geological knowledge but he was also a stellar teacher, researcher and mentor. Those of you that attended the 2015 Annual Meeting of The Society for Organic Petrology (TSOP) in Yogyakarta and went on the Mahakam Delta/Lakes field trip in Kalimantan will remember Chairul and his ready smile and sparkling sense of humour.

Chairul had been ill for some time after having a stroke and over the last year or so had moved from Jakarta to Padang, Sumatra. He was born in Solok, Sumatra Barat on the 10th of November 1950. He celebrated being a Sumatran and to anyone who knew him, he was a constant cheerleader for Padang food. A visit with him never passed without at least one trip to a Padang restaurant, which can be found all over Indonesia. And indeed, my favourite Indonesian dish is spicy beef rendang with rice - you can't get more Padang than that!



Chairul and wife Novi in Wollonggong, Australia circa 1992 (Photograph courtesy of M. Faiz)

Chairul graduated from the Academy of Geology and Mining in Bandung Indonesia with a B.Sc in Geology in 1976. Later he gained the degree of Engineer (Ir) in Geology from the prestigious Institute of Technology, Bandung (ITB), Indonesia in 1986. It wasn't long after that when he moved to Wollongong, Australia and gained his M.Sc in 1990 and then his Ph.D in 1994, both in Coal Geology from the University of Wollongong.

Chairul held many professional positions, both before and after getting his PhD. Prior to Wollongong, he worked at the Mineral Technology Development Centre in Bandung, Indonesia, first as a staff geologist then as a Chief of one of its groups from 1978 to 1988. From 1994 to 1997 he was a Project Manager at the Manpower Development Centre for Mines in Bandung, Indonesia. He then worked for industry from 1997 to 2001 as Chief Geologist for P.T. Austindo Nusantara Energi (Coal). Finally, since 2001 Chairul has been a lecturer at the Department of Mining Engineering, Trisakti University in Jakarta.

Dr Chairul Nas at a field trip stop in Kalimantan Timur (Borneo), Indonesia during the 2015 meeting of The Society for Organic Petrology (TSOP) (Photograph © Tim A. Moore)

Because of his great knowledge of Indonesian geology, Chairul also worked as advisor to many companies over the last twenty years including Sarinah Resources, Tigers Realm Group, Arrow Energy International, P.T. Geoservices and P.T. Kaltim Prima Coal, among others. He was a Cipher Associate consulting on various projects since 2010. Chairul was also instrumental in helping to establish an internationally recognised methodology for coal resource assessment for Indonesia. He was Chairman and/or Member of numerous committees including the Group of Exploration-Resource and Reserves, Association of Indonesian Mining Professionals (PERHAPI); the Indonesian Coal Mining Association; and the Committee for Coal Geologists Certification Program (IAGI).

Chairul had numerous publications and although I do not have a full list, the ones I do have are given below:

Friederich, M.C., Esterle, J.S., Moore, T.A., Nas, C., 2009. Variations in the sedimentological characteristics of Tertiary coals in SE Asia; and climatic influences on Tertiary coals and modern peats, AAPG Hedberg Conference. American Association of Petroleum Geologists, Jakarta, Indonesia, p. 6 pp.

Hutton, A., Daulay, B., Herudiyanto, Nas, C., Pujobroto, A., Sutarwan, H., 1994. Liptinite in Indonesian Tertiary coals. Energy & Fuels 8, 1465-1477.

Moore, T.A., Bowe, M., Nas, C., 2012. Effects of a shallow-seated heat source on coalbed methane reservoir character, Kalimantan Timur (Borneo), Indonesia, in: Dai, S. (Ed.), 29th Annual Meeting of The Society of Organic Petrology. State key Laboratory of Coal Resources & Safe Mining, China University of Mining and Technology (Beijing), Beijing, China, pp. 37-39.

Moore, T.A., Bowe, M., Nas, C., 2014. High heat flow effects on a coalbed methane reservoir, East Kalimantan (Borneo), Indonesia. International Journal of Coal Geology 131, 7-31.

Moore, T.A., Nas, C., 2013. The enigma of the Pinang Dome (Kalimantan Timur): A review of its origin, significance and influence on coal rank and coalbed methane properties, 37th Annual Convention & Exhibition, Indonesian Petroleum Association. Indonesian Petroleum Association, Paper IPA13-G-119, Jakarta, Indonesia, Not paginated. (*This paper won the 'Best Overall Paper' Award for this conference in 2013*).

Nas, C., 1994. Spatial variations in the thickness and coal quality of the Sangatta Seam, Kutei Basin, Kalimantan, Indonesia. University of Wollongong.

Nas, C., 2005. Coking coals in Indonesia: Occurrences and properties, in: Prihatmoko, S., Digdowirogo, S., Nas, C., van Leeuwen, T., Widjajanto, H. (Eds.), Indonesian Mineral and coal discoveries. Indonesian Association of Geologists, Bandung, Indonesia, 163-176 pp.

Nas, C., Pujobroto, A., 2000. Vitrinite macerals in Indonesian coal, in: Herudayanto, Sukarjo, Djaelani, E., Komarrudin (Eds.), Southeast Asian Coal Geology Conference. Directorate of Mineral Resources, Bandung, Indonesia, pp. 215-226.

I'd like to end with a final note about Chairul. Three of his personal traits were kindness, honesty and loyalty. While I was working at the Wyoming State Geological Survey in 1992, he reached out to me through an email on the (still) nascent internet asking if I could act as an advisor on his PhD. Of course, I said yes and from that moment on I had a life-long friend; one who gave more to me than I could ever have given to him. Although he would sometimes tease me about one thing or another or gently correct me on various aspects of Indonesian geology, his broad open smile always told me it was given in a kind, heartfelt manner. Chairul's spirit and geological nous will reign on for some time to come and I hope I can live up to his example both as a human and a geologist.

Tim A Moore

Spackman Award
Call for nominations, 2023
Deadline: May 31, 2023

PURPOSE

The Spackman Award, formerly known as the TSOP Student Grants Program (originally patterned after the 1998 AAPG Grants In Aid Program), supports graduate thesis research in organic petrology. Research must demonstrate the utility and significance of organic petrology (which includes coal petrology, kerogen petrology, organic geochemistry and related disciplines) in solving the thesis problem.

ELIGIBILITY

The Spackman Award supports qualified graduate students from around the world who are actively seeking advanced degrees. Applicants who have previously been granted a Spackman Award are not eligible to apply for a second grant under the scheme.

AWARDS

Usually two monetary awards, of U.S. $1,000 and $750 are granted. All applicants, whether successful or unsuccessful, are eligible to apply for one year of TSOP Student Membership at no cost

CONDITIONS

Monetary awards are to be applied to expenses directly related to the student's thesis work, such as field expenses, laboratory analyses, etc. A portion (not to exceed 25%) of the award funds may be used to attend a TSOP Annual Meeting. Funds should not be used to purchase capital equipment, to pay salaries, tuition, room, or board during the school year. Funds must be spent by the end of the calendar year following granting of the award, and an account of expenditure with copies of receipts should be provided by the end of that year (December 31, 2022 for awards granted in 2021).

ACCOUNTABILITY

All students who receive the Spackman Award are required to submit to the Chair of the TSOP Spackman Award Committee a document summarizing expenditure (see page 8 of the the award's application form) with copies of receipts, and (2) a summary of the research resulting from the grant. These submissions are due by the end of the year following the grant award. At the conclusion of the research project, awardees are required to publish an extended summary of their work in the TSOP Newsletter and will be encouraged to present their results at the TSOP Annual Meeting.

APPLICATION DEADLINE

Completed applications must be e-mailed by May 31, 2021 to: Justin Birdwell, Chair of TSOP Spackman Committee at **jbirdwell@usgs.gov.**

Application form: **https://www.tsop.org/Spackman_award_apply.html**

John Castaño Honorary Membership Award, Call for nominations, 2023

Deadline: May 31, 2023

TSOP members are invited to nominate the scientist of your choice for the 2023 John Castaño Honorary Membership Award, The Society for Organic Petrology's highest honor (https://www.tsop.org/Castano_award.html). The award acknowledges distinction in a scientific discipline of significance to the society, in recognition of contributions in research, service to TSOP, or education. The John Castaño Honorary Membership conveys life membership in the society. It is named in honor of John Castaño, one of our most active Houston-based founding members. John served as inaugural Vice-President, and later, as President of TSOP. He was an organizer of three TSOP meetings in the Houston area, and was made an Honorary Member in 1995. John served TSOP in many capacities until his death in 1997; a memorial article was published in the June 1997 issue of the TSOP Newsletter.

If you would like to suggest a candidate for the 2023 John Castaño Honorary Membership Award, please submit a letter of recommendation and a brief vita of the nominee to: Dr. Lei Zhao at **lei.zhao@y7mail.com,** Chair of the Committee by May 31, 2023.

It is suggested that supporting letters of recommendation from colleagues and other scientists accompany the package. Emphasis should be placed on the significance of the nominee's work.

Nominations will be reviewed by the John Castaño Award Committee and results will be announced at the Annual Meeting. The selection process is confidential and nominees do not have to be former or current TSOP members.

Dr. Lei Zhao

TSOP Vice President and
Chair of the Honorary Member Selection Committee

Student Travel Award

Deadline for the TSOP 2023 in Patras, Greece: June 1, 2023

PURPOSE

The Student Travel Award is designed to support student attendance at the annual TSOP meetings.

ELIGIBILITY

The Student Travel Award is open to students who have submitted an abstract for presentation (either oral or poster) at the Annual TSOP meeting. The abstract has to be accepted for the presentation.

AWARDS

Three (3) monetary awards of $1,000 (US) each will be granted. Money will be sent to the awardees (by PayPal or Western Union) before the TSOP Annual Meeting or provided to them during the TSOP General Luncheon at the meeting. ***Please note:*** **If an awardee requires visa to travel to the host country of the Annual Meeting, then before transferring the money student will have to submit to TSOP a proof of a visa.**

CONDITIONS

Monetary awards are to be applied to expenses directly related to travel to attend a TSOP Annual Meeting. Funds should not be used to fund research, purchase capital equipment, to pay salaries, tuition, room, or board during the school year.

ACCOUNTABILITY

Students receiving the award will be required to provide receipts detailing travel spending to TSOP after the meeting has concluded. Copies of travel receipts should be sent to the chair of the award commitee. ***Please note: If you received the Student Travel Award and are unable to travel to the conference the award money have to be returned to TSOP.***
Like most organizations we rely on sponsorship to help fund awards, hosting costs and other incidentals. This year the University of Johannesburg (South Africa) provided a large donation and we are especially grateful for that and also to TSOP member Dr Ofentse Moroeng for making that happen. We also are hugely grateful to the U.S. Geological Survey (USA) who also made a sizable donation. Also Cipher Consulting Pty Ltd (Brisbane, Australia) made a significant contribution of funds and finally we wish to thank Dr Xingjin Wang (Sydney, Australia) who made a spectacular personal donation.

APPLICATION DEADLINE

Completed applications must be e-mailed by June 1, 2023 to Biao Fu at **fubiao1223@gmail.com**, Chair of the Student Travel Award Committee.
Application form: **https://www.tsop.org/Travel_award_apply.html**

Completed applications should include:

1. Filled out Travel Award Application Form.
2. Title, authors and text of your abstract submitted to the TSOP Annual meeting.
3. Cover letter requesting travel funds and stating how attending the TSOP Annual meeting will help your research.
4. Letter of support from your primary faculty advisor (attach as separate document).

SELECTION

Applications will be reviewed and ranked by a committee of three TSOP members; selection of award winners will be based on a combination of quality of research/presentation and potential impact in the field of organic petrology.

COLIN WARD EMERGING STUDENT REASERCHER AWARD

Deadline for the TSOP 2023 in Patras, Greece: June 1, 2023

PURPOSE

The Colin Ward Emerging Student Researcher Award is designed to support a PhD students' first attendance at the annual TSOP meeting. The award also is designed to integrate the PhD student into the TSOP community.

ELIGIBILITY

The Award is open to PhD students in the field of organic petrology who never attended the TSOP meeting. The priority will be given to students who are early in their research, and reside in countries with low TSOP membership. Making a presentation (oral or poster) at the TSOP meeting is optional.

Note: if you are a master student or you have attended TSOP meeting before please apply for the TSOP Student Travel Award.

AWARDS

The award is funded by Kathie Ward and named after Colin Ward (1945-2018) in recognition of his outstanding academic and research career, contributions to coal science, and service to TSOP. One (1) monetary award of $700 (US) will be granted each year. Money will be sent to the awardee (by PayPal or Western Union) before the TSOP Annual Meeting or provided during the TSOP General Luncheon at the meeting along with a commemorative plaque.

The award also includes a 'meeting mentor' to help integrate the student into the TSOP community. The appointed meeting mentor is a long-time TSOP member who will serve as the social liaison for the awardee during the meeting experience. ***Please note:*** **If an awardee requires a visa to travel to the host country of the Annual Meeting, then before transferring the money, the student will have to submit to TSOP a proof of a travel visa.**

CONDITIONS

Monetary awards are to be applied to expenses directly related to travel to attend a TSOP Annual Meeting. Funds should not be used to fund research, purchase capital equipment, to pay salaries, tuition, room, or board during the school year. Students receiving the award will be required to provide receipts detailing travel spending to TSOP after the meeting has concluded.

ACCOUNTABILITY

After the meeting has concluded the student will also be required to submit a short article to the TSOP newsletter about their experience attending the TSOP meeting. ***Please note:*** **If you received the Ward Award and are unable to travel to the conference the award money has to be returned to TSOP.**

APPLICATION DEADLINE

Completed applications must be e-mailed by June 1, 2023 to David French at **davidfrench474@gmail.com**

Application form: **https://tsop.org/Ward_award_apply.html**

Completed applications should include:

- Filled out Application Form (download below) that includes essay of how attending a TSOP meeting will benefit student's research.
- Letter of support from student's primary faculty advisor (attach as separate document).

Permeability Anisotropy in Natural Fracture Framework of Coals using Topological Properties and Fluid flow

Sawan kumara, Sivaji Lahirib, Bodhisatwa Hazrab, Atul Kumar Varmaa*
[a]Coal Geology and Organic Petrology Laboratory, Department of Applied Geology, Indian Institute of Technology (Indian School of Mines) Dhanbad-826004, Jharkhand, India
[b]CSIR- Central Institute of Mining and Fuel Research, Dhanbad-826015, India
* Corresponding author: Atul Kumar Varma (atul@iitism.ac.in)

Coal was discovered in the mid-Zambezi Valley of southern Zambia in mid-1960s in the Gwembe Coal Formation (Nyambe, 1999). Coal production declined to almost zero in the early 2000s until privatization of the mine. Since then, coal production in Zambia has steadily increased to 1,231,000 short tons in 2021. The reserves are estimated to be 140 million tons of high grade and thermal grade coal, spread over 1,070 hectares. Few papers have been published on Zambian Coal and, to our knowledge, there are no papers describing the geochemistry of these coals.

Permeability anisotropy plays an important role in the fluid flow of the fractured coal systems. Understanding the directional variation in permeability is essential for accurate estimation of fluid flow in these systems. The aim of this investigation focuses on evaluating topological and geometrical properties such as connectivity, lacunarity and, fluid flow for analysing natural fracture networks and understanding their effects on permeability anisotropy. Fractures exist in networks of discontinuities and their arrangement may control various physical properties such as strength, porosity, permeability etc., within the same volume of coal (Adler and Thovert 1999; Sanderson and Nixon, 2015). Hence, characterization of these fracture networks is important in many sub-disciplines of earth sciences such as hydrogeology, reservoir characterization, basin modelling, hydrocarbon exploration structural geology, tectonics and petroleum sciences. These fracture networks exist as random patterns hence, their orientations, sizes, and spatial distributions often exhibit unique order which influences transport property (such as permeability). Therefore, it is imperative to quantify and understand the underlying formations in order to make robust predictions and understand transport phenomenon within these fractured coal formations.

Topological studies provide a way to understand the network as whole, by using proportions of isolated (I), abutting (Y) and crossing (X) nodes (Fig. 1a) and branches (II: isolated, IC: partially connected, CC: fully connected). The proportions of these nodes and branch types can be used to characterize the network (Sanderson and Nixon, 2018). Connectivity can be viewed as a measure of the degree to which elements of a network are interconnected; or based on the percolation theory, it can be defined as a limit or threshold value above which the network is “connected” and below which it is “unconnected”. This measure (connectivity) is independent of scale., which is quantified in terms of average connection per line (C_L) and average number of connections per branch (C_B) in a fracture network (Sanderson and Nixon, 2018). We analysed a total of 25 fracture patterns for this study. Using a MATLAB Toolbox, FracPaq2D, geometrical parameters and corresponding permeability anisotropies are determined for individual fracture pattern. The obtained permeability anisotropy ellipse (Fig. 1b) defines maximum and minimum permeability values for individual fracture pattern (Healy et al., 2017). Lacunarity is a parameter which measure the distribution of empty spaces and has been used to quantify scale (r) dependent clustering in fracture patterns. It can provide valuable information on the spatial arrangement of fractures and their effect on permeability anisotropy. We analyse Lacunarity in different directions to investigate the clustering anisotropy by rotating scanlines incrementally and computing Lacunarity at interval of 5 degrees. The quantification of anisotropy is important in fracture networks because it controls directionality of fluid flow (Roy, 2013). Hence, combined connectivity and lacunarity analysis can lead to more accurate predictions on permeability anisotropy in coal formations. Therefore, considering these topological properties, a more comprehensive understanding of the factors that influence fluid flow through fractured systems can be studied.

Further, fluid flow velocity or permeability estimation for natural fractures in 2D are performed using COMSOL Multiphysics software that enables modelling and analysis of complex physical systems. Gas flow analysis of coal seam have been performed in COMSOL Multiphysics in which a fractured image is transformed to computational domain to establish a relationship between coal permeability and fracture characteristics. (Luo et al., 2021). We intend to estimate fluid flow velocity using natural fracture patterns and establish a relationship between connectivity, lacunarity, flow velocity with permeability anisotropy. Estimation of fluid velocity in COMSOL is performed after following steps. The fracture geometry is imported into COMSOL followed by defining material properties and setting up the simulation by deciding suitable physics (such as fluid flow or subsurface flow) to set up a simulation environment after specifying required parameters and boundary conditions. Finally, the results of the simulation are analysed to estimate the fluid flow velocity of fracture patterns. Another unique feature of COMSOL is the ability to visualize and analyse the flow of fluids through the fracture network. This can provide us valuable insights into the behaviour of fluids in real-world fracture systems, such as the impact of connectivity and orientation on permeability anisotropy.
However, there is still much to be learned about the complex relationships between natural fracture networks and permeability

anisotropy. So, an attempt is made to establish a relationship between topological parameters and permeability anisotropy in these fracture patterns systems.

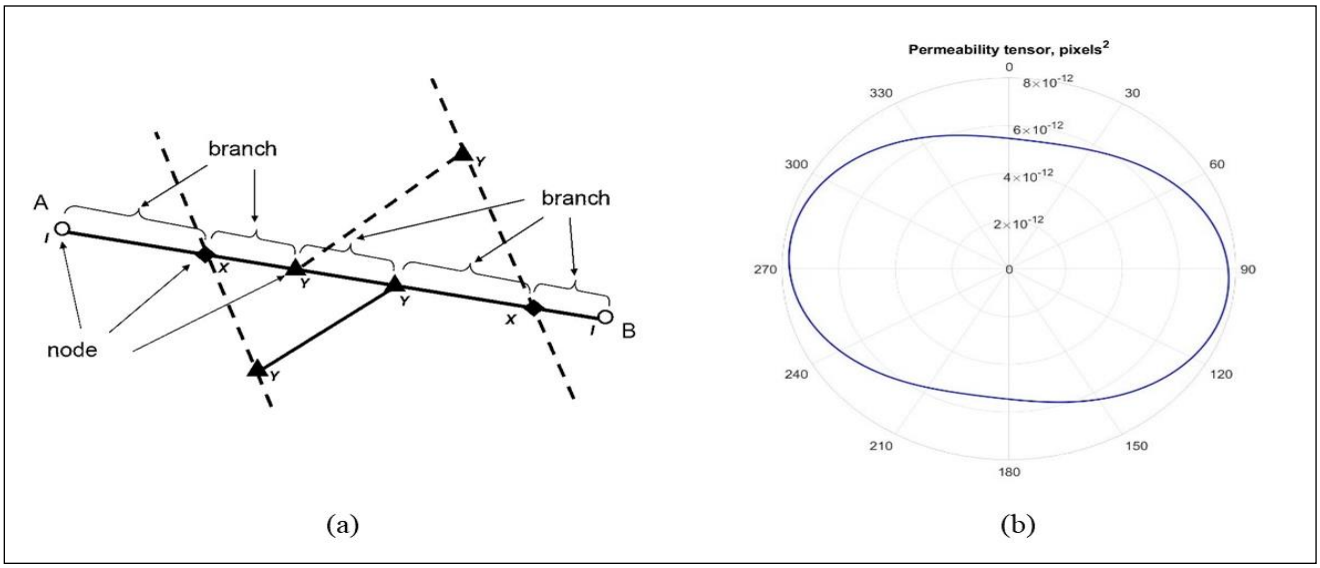


Fig.1: (a) Types of nodes in fracture network and branches (b) Permeability ellipse generated using FracPaq2D for a fracture pattern. Resuse of this figure from Sanderson and Nixon, 2018 is permitted by Elsevier and Copyright Clearance Center Licence No. 5503960483270 dated 07-March-2023.

References

1. Adler P.M., Thovert J.F. (1999). Fractures and Fracture Networks. Kluwer Academic Publishers, Dordrecht.
2. Healy D, Rizzo R.E., Cornwell D.G., Farrell N.J.C, Hannah Watkins H, Timms N.E, Rivas E.G., Smith M (2017). FracPaQ: A MATLAB™ toolbox for the quantification of fracture patterns, Journal of Structural Geology, 95, 1-16
3. Luo Y, Xia B, Li H, Hu H, Wu M, Ji K (2021). Fractal permeability model for dual-porosity media embedded with natural tortuous fractures, Fuel, 295,120610
4. Ankur., R. (2013). Scale-dependent heterogeneity in fracture data sets and grayscale images. PhD diss., University of Tennessee .
5. Sanderson D.J., Nixon C.W. (2015). The use of topology in fracture network characterization, Journal of Structural Geology, 72, 55-66
6. Sanderson D.J., Nixon C.W. (2018). Topology, connectivity and percolation in fracture networks, Journal of Structural Geology 115, 167–177
7. Zhang B, Li Y, Fantuzzi N, Zhao Y, Liu Y.B., Peng B and Chen J (2019). Investigation of the Flow Properties of CBM Based on Stochastic Fracture Network Modelling, Materials 2019, 12, 2387; doi:10.3390/ma12152387
8. Zhang X, Sanderson D.J. (1995). Anisotropic features of geometry and permeability in fractured rock masses, Engineering Geology, 40, 65-75

CALENDAR OF EVENTS

Please send in meeting, short course and special event announcements to the Editor
http://www.tsop.org/events.html

2023

geochemical society	***July 9-14, 2023*** **Goldschmidt Conference** – Lyon, France
TSOP The Society for Organic Petrology	***September 17-24, 2023*** 39th Annual TSOP Meeting – Patras, Greece
ICCP	***September 7-24, 2023*** **74th ICCP Annual Meeting**– Patras, Greece
THE GEOLOGICAL SOCIETY OF AMERICA®	***October 15-18, 2023*** 2023 GSA Annual Meeting - Pittsburgh, PA, USA

Maceral in coals from Southern Mongolia

- provided by Demberelsuren Batbold, Mongolian Mining Corp., Mongolia

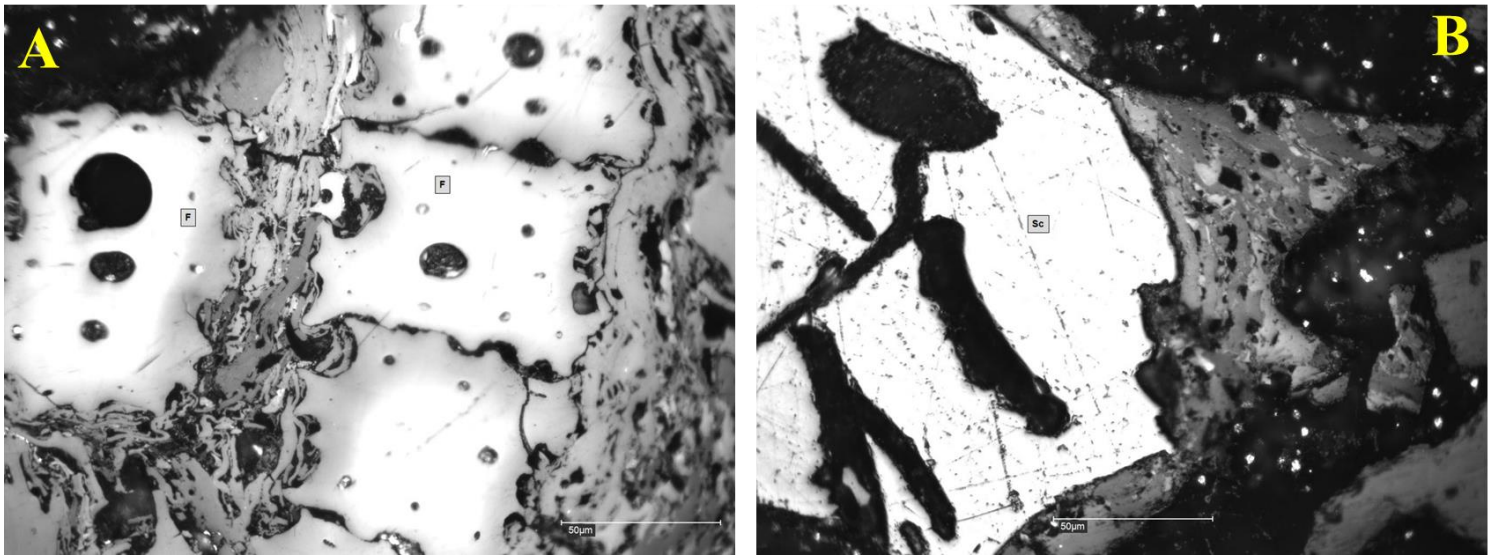


Image A: F-fusinite (same as cookies) in coal from 0CUL (UL-upper lower) third order ply of the Ukhaakhudag coal deposit in Southern Mongolia.
Image B:Sc-secretinite (same a pony with a wings) in coal from 0AL (L-lower) second order ply of the Ukhaakhudag coal deposit in Southern Mongolia.