THE SOCIETY FOR ORGANIC PETROLOGY

NEWSLETTER

Vol. 38, No. 2 June 2021 ISSN 0743-3816

The 37th Annual TSOP Meeting

Virtual Event

September 12-14, 2021

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http://www.tsop2021.org/

See page 2 for details!

37th TSOP ANNUAL MEETING
September 12-14, 2021
VIRTUAL EVENT

IT'S OUR VERY FIRST, FULLY ONLINE, VIRTUAL CONFERENCE

And we want your voice, your experiences, your challenges, and your solutions. Be a part of that history and future!

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Engaged: Connect with attendees from around the world to share ideas and discuss challenges.

Challenged: Hear from a diverse panel of speakers and keynoters who will encourage you to consider new ideas and opportunities for the future.

We look forward to connecting with you!

37th TSOP Conference will focus on five topics:

- Evaluation of the Unconventional Resources including Shale Gas, Shale Oil, Coal Bed Methane and Gas Hydrate
- Coal Geology, Resources and Utilization
- Petroleum Geology, Coal and Organic Petrology, and Geochemistry
- Toxic or Valuable Trace Elements and Minerals in Coal and Coal Ash
- New Techniques and Applications
- Environmental science applications of organic petrology

Visit the Website to Register Today!

http://www.tsop2021.org/

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:
Rachel Walker 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

September Issue: Sept. 10th, 2021
December Issue: Dec. 10th, 2021
March Issue: March 10th, 2022
June Issue: June 10th, 2022

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President's Letter

Dear TSOP Members,

There is good news from this side—we are slowly opening back up. Almost sixty percent of adults here in our area have been fully vaccinated and vaccines are available for children as young as twelve. There are no more social distancing and restaurant capacity limitations. The masks have come off, especially outside, although unvaccinated persons are still asked to remain masked. My 10-year-old daughter has been back in school four days per week for several weeks now, and of course the schools require masking since children her age can't get vaccinated.

We are planning our family vacations for the summer and recently enjoyed a weekend barbecue with the neighbors—it really feels like things are coming back to normal. Although, access to the USGS is still limited and I'm allowed only one day per week in the laboratory. Nevertheless, there are rumors that even USGS will be opening back up soon. How exciting to think two people will be able to sit at the microscope again and discuss organic petrology.

Being allowed into the laboratory one day per week means that I've generated enough data to create an abstract for the virtual TSOP meeting in September. Now I just have to write it. The upcoming meeting, hosted from Sofia by TSOP Councilor Irena Kostova and her organizing committee, will be our first ever all online virtual meeting. I hope TSOP members are now planning for their virtual attendance on September 12-14. Please register and submit your abstracts! Visit http://www.tsop2021.org/ or look elsewhere in this issue of TSOP News for more information.

I have participated now in several virtual meetings, and I find the experiences are quite different from each. Zoom seems to be a good venue for smaller, specialized meetings, from 5-10 to up to 50-60 participants, especially if the moderator/meetings hosts are dynamic and competent enough to keep things on track (I could never do it). The smaller number of participants allows for a fruitful information exchange, with direct connection between the speakers and participants on Zoom. On the other hand, I had a less fortunate experience attending and presenting in a larger meeting, where the discussion had to be limited to a small group of people 'in the room,' with a larger number of outside observers looking in but unable to directly engage. I've found that I also prefer live presentations as opposed to pre-recorded, with the live format seeming to offer more opportunity for 'off-the-cuff' discussion and information exchange. I'm sure that many TSOP members have now had opportunities for virtual meeting attendance, and there's probably as many opinions as to the formats we prefer as there are virtual attendees. No matter the format for this year's virtual TSOP meeting, I hope to see and talk with you in September.

Be safe and well,

Paul Hackley, TSOP President 2019-2021

Find us on Facebook

www.facebook.com/OrganicPetrology

AAPG Datapages, Inc.

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

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.

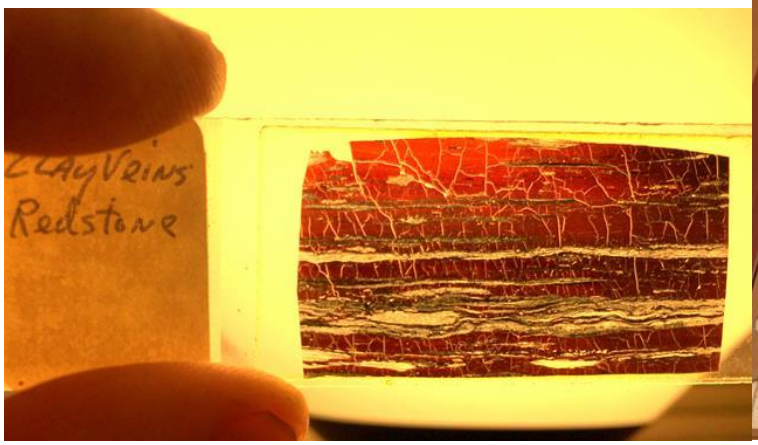
You can login at the Members Only TSOP website and select 'Online dues payment' or go to www.tsop.org/dues and access the online form without logging in.

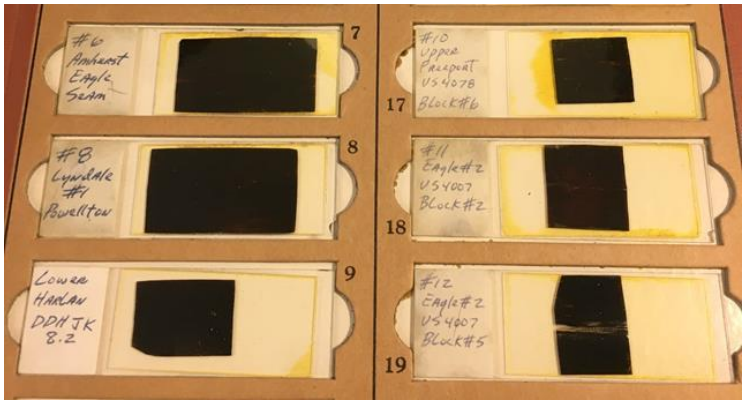
Thank you for your interest and support of TSOP and we look forward to a renewal of your TSOP membership.

COAL THIN SECTIONS FREE TO A GOOD HOME

I have a collection of coal thin sections that once belonged to Ralph Gray at US Steel, representing samples from several of the coal mines operated by US Steel, probably in the 1960s. They fell into my hands a number of years ago when I was working with a group of former USS geologists at GeoMet Operating Company, a CBM producer in Alabama. I thought perhaps I'd eventually be able to use them for instructional purposes, but...well...that never happened.

These samples come from a time when American coal petrologists were still transitioning from using thin sections to using polished grain mounts in reflected light as the principal method of describing the petrographic composition of coal. 17 of the thin sections are grain mounts of what appears to be approximately -60 mesh samples, which may be of limited utility. 19 of the slides however represent sample blocks from some well-known coal seams, primarily from the Appalachian Basin. Several of them display some interesting looking features, as shown in the (very crude, handheld) iPhone photomicrographs below.





In case more than one person is interested, please provide a very brief statement about how the slides will be used. Jeff Levine, (TSOP President, 1996-97); Jeffrey@LevineOnLine.com

ATLAS OF WOOD PELLET COMPONENTS

Agnieszka Drobniak[1]*, Zbigniew Jelonek[2], Maria Mastalerz[1], and Iwona Jelonek[2]

[1]Indiana University, Indiana Geological and Water Survey, 1001 E. 10th St., Bloomington, IN 47405, USA
[2]University of Silesia in Katowice, Institute of Earth Sciences, ul. Będzińska 60, 41-200 Sosnowiec, Poland

** Corresponding author: agdrobni@indiana.edu*

The atlas can be viewed free of charge at: **http://go.iu.edu/woodpelletatlas**
and the introductory text with classification and references at:
https://scholarworks.iu.edu/journals/index.php/IJES/article/view/31905/36173

The increasing production and consumption of wood pellets and the wide variety of materials used in their manufacture have brought up the question of how to assure pellet quality. While wood smoke contains more than 200 distinct organic compounds, many of which have been shown to cause acute or chronic health effects and to pollute the atmosphere, limited research has been conducted to understand the relationship between the quality of wood pellets and the impact of their combustion emissions on human safety and the environment. This is especially critical in the case of BBQ wood pellets, as smoke from their combustion has direct contact with food and the emissions are inhaled during grilling.

Our research shows that wood pellets can contain a wide array of contaminants, in some extreme cases even more than 20 % of impurities. While some of those contaminants are so large that they are visible with the naked eye, most of the impurities are at a micrometer scale and can be detected and identified only under a microscope (Figures 1-2). Some impurities come from the structure of the wood itself, its harvesting method, and transportation. Others, like metal, rust, oils, and grease, can be introduced during the manufacturing process. Such impurities cannot be avoided and are acceptable at low levels. However, additional contaminants can result from machinery malfunctions or inadequate wood source material (old furniture or construction materials that contain glues, resins, or paint). In some instances, their presence is a result of the lack of attention (pieces of plastic bags), or they can be intentionally added (plastic and tire rubber) to make ignition easier and increase heat output. These examples show that pellet testing is of critical importance because the presence of these contaminants can lead to emissions of carcinogenic compounds and harmful particulate matter suspended in smoke.

Figure 1. Wood pellets having very high contents of impurities that are visible megascopically in raw samples (A–C) and a microscope plug (D). A = ash, Bk = bark, C = coal, Gl = glass, M = metal, O = binder, Pl = plastic.

The current standards test the quality of pellets based on a variety of physical and chemical properties, but some impurities (glass, plastic, rubber, metal, ceramics, coal, and coke) are not easily identified this way. Our research shows that optical microscopy can be successfully used to identify and quantify those contaminants. Although reflected light microscopy is a well-known and widely used method that allows various materials to be examined, including geological specimens and rocks, it is a novel application for wood pellets.

This methodology, developed by our research team, has proved to be an excellent tool for quality testing, and it can help enhance production of superior pellet fuels.

This analytical method is already recognized and implemented as obligatory for testing for inadmissible additions in grilling charcoal briquettes (EN 1860-2:2005). In our pellet fuels research, we have analyzed a large number of wood pellets and collected thousands of photomicrographs of various pellet components. Our "Atlas of Wood Pellet Components" features more than 300 photographs taken between 2019 and 2021 while we developed the method of using reflected light microscopy to identify pellet fuel constituents. These photomicrographs provide documentation of the composition of wood pellets and demonstrate the array of impurities that can be present. As such, this atlas is a valuable source of information for anyone interested in pellet fuels, optical microscopy, and quality assessment techniques.

Figure 2. Photomicrographs of selected wood pellet components in reflected white light and oil immersion. A = ash, B = biomass, Bk = bark, Ch = charcoal, Co = coke, Cr = ceramic, CS = coal in slag, Gl = glass, Gr = grease, Gu = glue, LP = liquid petroleum, M = metal, Pl = plastic, Qz = quartz, S = slag, SP = stone powder, R = rust.

Origins of TSOP's secure website: notes and observations from its retiring manager and former Secretary/Treasurer.

Subtitle: TSOP is not for academics only

I have always been somewhat in awe of TSOP and its history including its distinguished membership. This included some of the greatest organic/coal petrographers to look down a microscope. In the early 1980's I remember my then supervisor Peter Hacquebard telling me about a new North American group being formed by the top organic/coal petrographers at that time. He encouraged me to send in a membership form (hardcopy 'snail' mail at that time). Little did I know how far and long that application would take me.

Despite my glaring lack of qualifications and education credentials Peter supported me in attending some early TSOP meetings. Interest in fluorescence measurements was growing and I was fortunate enough to attend Karl Ottenjann's special seminar at the Adam's Mark in Houston, Texas, April 1984. Being the lone organic petrography technician in Eastern Canada, TSOP was a bit of a lifeline for me. After co-hosting the successful 1998 Halifax meeting with Dr. Mukhopadhyay, I must have garnered some attention. Peter Warwick trusted me enough to offer the opportunity to take over his not so sought-after position as Secretary/Treasurer. After four years the position was split into two separate offices, and I remained Treasurer for eight more years for a total of at least twelve years on TSOP Council.

By 2007-08 TSOP considered that it was falling behind in its online presence. It seemed like it would be such a great thing to have a secure sub-section of the tsop.org website that could only be accessed by member login. Again, with a glaring lack of qualifications I had dabbled in computer programming to support my organic petrography work and other projects. Boldly and with the tentative support of TSOP Council, I proposed to take on such a task. With some research and lucky book finds, I cobbled together a login system which was opened to the general membership on October 30, 2009. To my amazement with only a few very small glitches it worked! I clearly remember the enthusiastic responses from Council members at the time.

In the 12 years since the launch there has never been a breach of the system or any loss of personal or 'TSOP' sensitive data. In all that time it never cost TSOP a cent and in fact it created significant savings. A secure online membership directory dispensed with the need for escalating mailing costs. Members could now login and update their contact information as needed. Now a member could check on their dues payment history and pay their dues and/or make a donation to TSOP's special funds via an online form and allowing credit card payments through PayPal.

As I retire from TSOP more completely this time I am hoping that this short note might be of some interest to the membership. And also, I hope it encourages other members and potential members working as an organic petrographic technicians to apply their knowledge and skills to supporting and maybe even improving TSOP or other similar scientific societies. In closing I wish the new secure website manager luck in taking on the task of keeping that part of our web presence running smoothly.

Mike Avery,
Organic petrography technician
Geological Survey of Canada (Retired)

A Special Note of Appreciation for Mike Avery

I first met Mike at the 2003 TSOP meeting in Washington DC, but it was the 2005 meeting in Louisville where I got to know a little about him. Mike presented a touching remembrance of Peter Hacquebard that brought tears to our eyes and revealed Mike's big heart and affection for his longtime mentor. Upon walking with Mike to one of the meeting's social functions, I recall he resembled exactly a stevedore from the Port of Halifax with his black stocking cap and trim goatee. Two years later at the Victoria meeting, Mike and I shared a UBC graduate dorm with Alan Cook and Paddy Ranasinghe (see photo) where we were treated to Paddy's amazing curry dishes (which did not include any of the furry bunnies hopping across campus).

Mike has contributed in so many ways to TSOP, from serving on Council as Secretary-Treasurer and Treasurer (for 12 years altogether!), to his roles in organization of the 1998 and 2011 meetings in Halifax (where I did see an actual stevedore, nothing at all like Mike). From scratch, Mike created TSOP's original secure website in 2009, which I used as then membership committee chair to make the biannual membership committee reports to Council. I can't remember why exactly we were joking about my codename being 007, but Mike created a special 'for 007 only' report button in the secure site which generated the membership report. Mike's contributions to TSOP over the years have been recognized by the Distinguished Service Award in 2011 and bestowment of the Lifetime Membership Award, an honor which Mike shares with only one other awardee.

On behalf of TSOP Council, I would like to make this special note of appreciation for all of Mike's contributions to TSOP, and especially for his selfless dedication to development of the original secure membership database. Thanks Mike, for all of your service to TSOP!

Paul Hackley

Paul Hackley, TSOP President 2019-2021

Deformational Features of Macerals in Anthracite from the Rangit Tectonic Window, Sikkim, India

Santanu Ghosh, Atul Kumar Varma*

Coal Geology and Organic Petrology Laboratory, Department of Applied Geology,
Indian Institute of Technology (Indian School of Mines) Dhanbad-826004, Jharkhand, India

* Corresponding author email id: atul@iitism.ac.in (Atul Kumar Varma)

Tectonic deformation episodes imprint permanent streaks on tectonically deformed coals, and coal macerals record those deformation and peak metamorphism events through physico-chemical transformations, which can offer several layouts to reconstruct those incidents employing various proxy elements. Usually, anthracite depicts the coupled influences of tectonic stress and temperature through developing optical anisotropy in vitrinite grains driven by the changes in the orientations of the Basic Structural Units. The Reflectance Indicating Surface represents the optical sign and microtextural heterogeneity of vitrinite grains, which may estimate the degree of tectonic deformation. The anthracite A samples (R_{MAX} = 5.94 – 8.66 %; $\bar{R}_r$ = 4.11 – 5.36 %) from the Rangit Window of the Himalayan Fold-Thrust Belts of Sikkim, India, reveal highly bireflecting vitrinite grains with biaxial negative optical sign (R_{st} = −9.98 to −19.37) and highly heterogeneous microtexture (Ghosh et al., 2018), which may reflect the orogenic deformational impacts of the Himalayas.

Additionally, the relative area ratio of the defect (D_1) and graphitic (G) bands obtained from the Raman spectroscopy and the maximum metamorphic temperature (T_m) calculated from that ratio suggested greenschist facies metamorphism of these samples. Besides, a new approach was undertaken to depict the orogenic deformational influences on these anthracite macerals through a microlithotype classification modified from the standard notations described in ISO (2017). The microlithotype analysis was conducted using the Leica DM 6000 microscope under a 20X oil objective (Leica immersion oil) at the School of Earth and Environmental Sciences, University of Queensland, Australia. The new notations were proposed based on the optical appearances of the macerals and were classified into three classes, (a) deformed, (b) sheared, and (c) smashed vitrite and inertite grains (Fig. 1), which illustrated the deformational features associated with these maceral grains induced by the Himalayan orogeny (Ghosh et al., 2018).

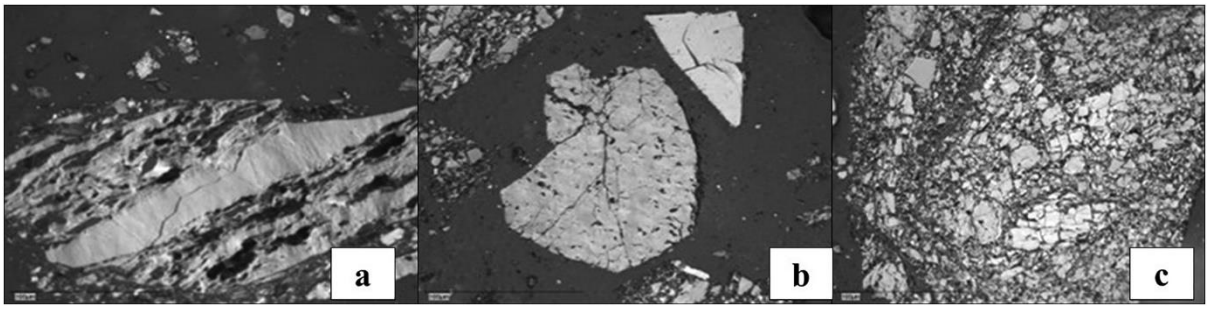


Fig. 1 (a) Deformed grain, (b) Shared grain, and (c) Smashed grain classified from the modified microlithotype analysis of the anthracite samples collected from the Rangit Window, Sikkim, India (following Ghosh et al., 2018; permitted to reuse under terms and conditions provided by Elsevier and Copyright Clearance Center; License No: 5077500140428; dated: 28th May, 2021).

The sheared and smashed grains dominated over the deformed grains in all the samples, which may suggest significant effects of tectonic shear stress on the maceral grains substantiating the Reflectance Indicating Surface characteristics. The rotation of bonds within the chemical moieties under shear stress often disturb the parallel alignment of the Basic Structural Units in anthracite, and these are represented by screw, edge, and Stone-Wales dislocations. Usually, the bonds get adequate chances to acclimatize themselves to the tectonic stress, and hence, organic matter reveals plastic deformation with barely any structural failure (Han et al., 2017).

Meanwhile, when the bonds barely get any chance to adapt themselves to the extremely high amplitude of shear stress, they disintegrate, and the organic matter experiences structural failure and breakage. The Himalayan orogenic activities exerted a large amplitude of anisotropic tectonic shear stress and introduced structural dislocations in the anthracite microstructure, which was complemented by the larger area of the D_1 defect band than the crystalline G band in these samples revealed by the Raman spectroscopy. When the bonds between the chemical moieties in the maceral grains, mostly adapted to that stress, macerals exhibited a 'deformed' structure. Shared macerals would be the result of relatively higher plastic deformation of the maceral grains than the deformed grains but without any structural failure.

Meanwhile, the chemical structure of the smashed grains could not adapt to the shear stress resulting in breakage or structural failure. The Stone-Wales dislocations would be accountable for the structural failure of these smashed grains. Further, the proximity of the anthracite samples to the respective thrusts would be responsible for ambiguities in the sheared vitrite and inertite grain concentrations among the samples. The anthracites sampled from the hinterland dipping horses of the Rangit Window would have proximal exposure to the respective thrust systems and hence, revealed more deformation of the maceral grains and consequently more sheared grains compared to the anthracites collected from the foreland dipping horses. This study, hence, offered a novel approach to apply the microlithotypes in revealing deformational aspects of macerals in tectonically deformed coals, besides their use in elucidating palaeodepositional facies of organic matter.

Acknowledgement
The authors are indebted to Prof. Joan Esterle, Emeritus Professor, School of Earth and Environmental Sciences, University of Queensland, Australia, for arranging an Occupational Traineeship program for Dr. Santanu Ghosh.

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International Meeting on Organic Geochemistry
12th - 17th September 2021
Online

The International Meeting on Organic Geochemistry (IMOG), the flagship meeting of the European Association of Organic Geochemists (EAOG), will be held online from the 12th to 17th of September this year. This biennial meeting brings together organic geochemists, organic petrographers, and petroleum and coal geochemists, as well as those studying soil, environmental and biogeochemistry, for four days of intense technical discussion. The meeting's format this year allows participation without travel, at a reduced registration fee. Full details are at https://eage.eventsair.com/imog-2021/ and meeting topic coverage is listed at https://eage.eventsair.com/imog-2021/topics. In addition, interested exhibitors may join the virtual exhibition for exposure to a large slice of geochemists worldwide. Meeting registration is now open at https://eage.eventsair.com/imog-2021/registration.

Do the IMOG meeting dates – 12th to 17th September 2021 – sound familiar? They should, because TSOP's 2021 meeting will also be held online from the 12th to 14th of September! However, because of the magic of online meetings, TSOP conference registrants will still be able to "attend' the IMOG. Registration for the IMOG gives registrants the opportunity to attend the meeting "live" or anytime within two weeks after the meeting. IMOG will utilize an online event portal https://eage.eventsair.com/imog-2021/online-platform which will allow for networking, live discussions, and access to OnDemand Video of all IMOG session recordings "for the duration of the conference and two weeks after". This is similar to the TSOP online meeting this year: sessions from the TSOP Conference will be available to all registrants for two months after the meeting (http://www.tsop2021.org/what-you-should-know/). This online approach for the IMOG and the TSOP Conference gives all of us an opportunity to attend both meetings, without travel costs, even though they conflict in real time.

And for those of you with a professional interest in the organic geochemistry side of organic petrology: the TSOP Liaison Committee has opened discussions with the European Association of Organic Geochemists, to seek a closer relationship between TSOP and EAOG. Although not finalized yet, this closer relationship could include joint efforts to promote increased membership, collaborative technical discussions, cross-postings on each other's websites and newsletters, and possible meeting registration discounts. Depending on progress in these discussions, we may be able to announce some of this in September, online, at the TSOP Conference and at IMOG.

Joe Curiale
Chair, TSOP Liaison Committee

CALENDAR OF EVENTS
2021

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

August 16-21, 2021
36th International Geological Congress
Delhi, India
https://www.36igc.org/

September 19-25
ICCP Annual Meeting
Prague, Czech Republic
http://design.bsp.cz/ICCP/en/#home

September 12-14, 2021
37th TSOP Annual Meeting
from Sofia, Bulgaria – **ONLINE**
http://www.tsop2021.org/

September 13-17, 2021
International Meeting on Organic Geochemistry
ONLINE
https://eage.eventsair.com/imog-2021/