International Association of Wildland Fire

Early Career Award in Fire Science

2016 Recipient

Dr. Guillermo Rein, Senior Lecturer, Imperial College London, UK

Dr. Rein is a prominent fire behavior scientist, studying ignition, combustion emission, smoldering and interactions of fires and ecosystems. At this early stage of his career, his greatest contributions have been in the area of smoldering wildfires, where he has revolutionized the experimental and numerical description of these fires, translating science from engineering to applications such as fire history, emissions and climate change. This work has been published in over 67 journal papers, receiving more than 1700 citations throughout his short career. Among these, 17 journal papers and 6 keynote lectures have focused specifically on wildland fires.

Dr. Rein was first introduced to the subject of wildland fires by Professor Scott Stephens in his course Fire Ecology at University of California, Berkeley. Immediately following his PhD on computational smoldering combustion (graduated in Dec. 2005), he began his early research career on wildland fires as a member of the large international consortium, Fire Paradox (EU FP7) in 2006. Since then, he became a leader in the emerging field of smoldering wildfires, relating their effects to carbon emissions, fire ecology, and climate change. The impact of his work in both the combustion and geoscience communities has been equally impressive and measurable. The results of his wildfire work have been published in 2 book chapters, the International Journal of Wildland Fire, the Proceedings of the National Academy of Sciences (PNAS), Nature Geoscience and awarded twice the Distinguished Paper Awards (2009 and 2013) in the Proceedings of the Combustion Institute.

His research contributions have also impacted wildland fire safety through: (1) pioneering understanding peat fires whose emissions greatly impact global carbon emission and health, (2) developing techniques and improving understanding of the flammability of live and dead fuels, and (3) model development on improved forecasting for wind-driven wildland fires. Besides specific research contributions, his multidisciplinary research approach has brought together many dissimilar fields such as ecology, geoscience, fire protection engineering, and combustion to study wildland fires. This approach has spread throughout the communities he has worked with, including 5 PhD students and 2 MSc students, continuing his legacy of multidisciplinary wildland fire research. Through these ongoing research activities, he is determined to grow powerful modelling capabilities that can meet the needs of an increasingly sophisticated field of fire management and also to provide better estimations of global greenhouse gas emissions from wildfires in various ecosystems. Most recently, he was invited by the Editors of PNAS to write a commentary on recent scientific discoveries in wildland fire spread (doi: 10.1073/pnas.1512432112).

In addition to these scientific contributions, he has been an important proponent of enhancing collaboration between the wildland fire community and traditional urban fire research. As Editor-inChief of Fire Technology, he has been actively promoting the number of papers in wildland fires, both increasing visibility within the field and soliciting multidisciplinary contributions. Four special issues on wildland fires, especially at the intersection of the Wildland Urban Interface (WUI) have been published during his tenure. He is also a member of the board of directors of the IAWF and a member of the management committee of the International Association of Fire Safety Science (IAFSS). He has also been active in wildfire international conferences such as Int. Conference on Forest Fire Research (ICFFR), Fire Effects on Soil Properties (FESP), and General Assembly of European Geosciences Union (EGU) to bridge the gap between geoscience and wildland fire safety. He has shared the results of his research and thoughts on international media, including the New York Times, BBC, and DotEarth.

There is no doubt that through his multidisciplinary contributions, Dr. Rein has begun to deepen our understanding of wildland fire and improve worldwide wildland fire safety. Most importantly, Dr. Rein has been an emerging force for change that is paying dividends through a plethora of multidisciplinary collaborations across Europe, America and Asia.

Short Biography: Dr. Guillermo Rein first studied fire at ICAI Universidad Pontificia Comillas, Spain (MEng, 1999). After completing his MSc (2003) and PhD (2005) on smoldering fires at the University of California, Berkeley, he worked at the BRE Centre for Fire Safety Engineering at the University of Edinburgh as a Lecturer (2006-2011) and Senior Lecturer (2011-2012). Recently, he joined Imperial College, London as a Senior Lecturer (2012-2015) and Reader (previous step to full Professor) in Thermal Energy (2015). Since 2013, he has been the Editor-in-Chief of Fire Technology, not only multiplying the journal impact factor by 10, but also boosting the prevalence of wildland fire topics.

Guillermo will receive the award at the 2nd International Smoke Symposium in Long Beach, California November 14-17, 2016

2017 Recipient

Travis Paveglio, Assistant Professor, Department of Natural Resources and Society, University of Idaho

Dr. Paveglio's remarkable research trajectory and innovative ideas are reshaping how we think about resilient and adaptive communities in the wildland urban interface. His work is truly path breaking both theoretically and practically for how we can create more fire adapted communities. Dr. Paveglio is currently an Assistant Professor in the Department of Natural Resources and Society at the University of Idaho. He has been a remarkably productive scholar for one so junior in his career. He has currently published as first author or co-author 33 peer reviewed publications. In his short career, he has proven to be a world class collaborator working across disciplinary boundaries beyond his home field in social science. He routinely works with and understands linkages among agencies, academia, local administrative units, and landowners affected by wildfire. He has secured $7,301,508 in grants as Co-Principle Investigator, with $232,416 as Principle Investigator.

Dr. Paveglio, along with his co-authors, is using the concept of community archetypes to understand differential community adaptations to wildfire risk. This is pioneering work related to differentiating communities in the wildland-urban interface, including how fire mitigation programs for rural, resource-based communities differ from more amenity based communities among others. The key publication in this work is Paveglio et al. 2015 in which he and his co-authors conducted a meta-analysis of 20-years of case study research and identified key archetypes to characterize the social complexity of wildland urban interface communities as it relates to adaption to wildfire risk. This work begins to identify key pathways most likely to promote effective fire adaption tailored to specific community traits, including the types of policy preferences and mitigation strategies most likely to contribute to co-management of wildfire risk across jurisdictions. This work is also summarized in the prestigious journal Philosophical Transactions B (Carroll and Paveligo 2016).

Dr. Paveligo's work in this field has direct implications for managers who seek to work more effectively with communities prior to wildfires, and for managers who need to work actively with communities during and after wildfires. The archetype approach helps us understand the local capacity to plan for, respond to, and recover from wildfire. For a professor so junior in his career, his work has been unusually directed and use-oriented. In this way, he is working toward articulated needs for future research related to wildfire management. Because of his unusual theoretical and practical skill set, I believe he is worthy of serious consideration for the IAWF Early Career Award for Fire Science.

In addition to his research success, he is also a valued mentor to his students thereby influencing the next generation of wildfire scientists. As offered by one of his students, Dr. Paveglio has been noted to be "an outstanding source of knowledge and support for his students, making himself available to answer questions around the clock and going above and beyond to provide excellent feedback to foster improvement. His outstanding

mentorship is founded on treating his students as equals and encouraging them to get involved in diverse research, publishing, and to engage in opportunities to disseminate findings to professionals and the public. Above all, it is the personal connection that Travis builds with each of his students which creates a remarkable environment for graduate student success." This testimony, in addition to his excellent scholarship, qualify him for this important award.

Travis received the award at the IAWF Awards Dinner in Boise in October 2017.

2018 Recipient

Dr. Nicholas Skowronski, Northern Research Station, US Forest Service

The 2018 recipient of the IAWF Early Career Award in Fire Science is Dr. Nicholas Skowronski. Nick is a research forester with the Northern Research Station, US Forest Service. His award was presented by Alen Slijepcevic, IAWF President, at the Fire Continuum Conference in Missoula.

The Early Career in Fire Science award is to recognize a promising early-career professional who has demonstrated outstanding ability in the field of wildland fire science. "Early career" is nominally taken to include professionals who are within ten years of having earned their highest degree or are under 40 years of age when nominated.
Nick's current research focuses on the quantification and analysis of the structural characteristics of forest canopies and how this relates to carbon and water cycles. He has recently been using a newly emerging remote sensing technology called LiDAR which actively characterizes the canopy with a laser beam. His work is split between developing methods for using LiDAR and other remotes sensing techniques for wildfire mitigation and studying how forest functionality changes after disturbance.

A few comments from the folks who nominated Nick:
"Dr. Skowronski has a proven capacity to involve people beyond the realm of wildfire research and encompasses the spirit of true inclusivity and collaboration. He has great experience in the field conducting prescribed fire research and is also the successful founder and lead scientist of the North Atlantic Fire Science Exchange."

"Dr. Skowronski has a solid record of published and impactful research. He continues to make important contributions concerning the application of remote sensing and LiDAR to wildfire management. Dr. Skowronski appears to interact with a variety of managers, academics, and practitioners--he serves as a bridge between knowledge development and practice. He also serves as the PI for the North Atlantic Fire Science Consortium, which demonstrates a commitment to outreach."

"Nicholas Skowronski has a strong authorship to merit his nomination of this award. The versatility of his work indicate that he has strong cross-disciplinary skills that are greatly underrepresented and greatly needed in the world of wildfire research. Additionally, his experience "walking the walk" elevates his qualifications to receive this award, as all wildfire science should seek to answer questions and improve our on-the-ground understanding of wildfire.

2019 Recipient
Dr. Sara McAllister, US Forest Service

IAWF is proud to announce that the 2019 recipient of the IAWF Early Career in Fire Science Award is Dr. Sara McAllister. Sara has been a Research Scientist for the US Forest Service at the Missoula Fire Sciences Laboratory since 2009. She graduated from the University of California, Berkeley with a Ph.D. in Mechanical Engineering where she focused on spacecraft flammability for NASA. Her background in combustion and engineering has enabled her to bring unique insight into the physical processes controlling ignition, fire spread, and burning.

Since her arrival at the Missoula Fire Sciences Laboratory, she has performed ground-breaking experimental research on ignition criteria for live and dead wildland fuel materials, explored poorly understood convective heating of live and dead forest fuels, and extended knowledge and theory of burning rates of porous wildland fuel beds. It is rare that in such a short time, one researcher could have made so much progress in this direction.

Sara is the author of 28 refereed publications and 35 conference presentations and proceedings, as well as a popular university textbook, "Fundamentals of Combustion Processes" which is based on a course she co-taught while at UC Berkeley. She is a leader in the field, promoting wildland fire science in both traditional wildland fire organizations and the engineering community. Some of her recent leadership activities have included co-organizing the workshop "Large Outdoor Fires and the Built Environment", co-organizer of a special session for Forest Fire at the 8th International Symposium on Scale Modeling, section editor for the Encyclopedia of Wildland and WUI Fire for Springer-Nature, and leader of a special session at the AFE Fire Congress on "Physical Mechanisms of Wildland Fire Spread".

Recently, she was appointed as the scientific program co-chair for the 12th International Symposium on Fire Safety Science and also leads a new working group on Large Outdoor Fires and the Built Environment, helping to link the fire science and structural fire communities. She is active in the Combustion Institute, International Association for Wildland Fire (IAWF), Association for Fire Ecology, and the International Association for Fire Safety Science (IAFSS). In total, she's chaired or co-chaired 11 symposia and special sessions and serves as an active member of the Editorial Board for Fire Technology and Fire Safety Journal. All these activities demonstrate her continued commitment to linking the traditional building and wildland fire science communities together.

Sara is one of the most promising and impactful young researchers in the wildland fire community today. She has made outstanding scientific contributions and demonstrated leadership in the wildland fire community and is incredibly deserving of recognition by IAWF with the Early Career Award in Fire Science.

2020 Recipient

Dr. Alexander Filkov

Dr. Alexander Filkov's research program and expertise in fire behavior is recognized at a national and international level. His work covers a broad range of fire behaviour topics including research on the ignition and combustion of fuels, the spread of wildfire and transition mechanisms to the Wildland Urban Interface (WUI), and the performance of structural materials under different fire conditions. Dr. Filkov's publications have made a significant contribution to the following areas of fire behaviour: deterministic-probabilistic modelling, thermal behaviour of fuel, firebrand generation and spotting mechanisms, dynamic fire behaviours and fire performance of materials. His international reputation and broad network of peers have allowed Dr Filkov to organise and participate in several large field experiments on forest and grass fires in Russia, the USA, and Australia. His early research at Tomsk State University in Russia was focused on the development of a new deterministic and probabilistic model to predict forest, grass and peat fire hazards. This research is important and unique, presenting for the first time an accurate set of physical and mathematical models for predicting forest and steppe fire hazard. Dr Filkov's research also focused on the field and laboratory study of forest and grass fires and their impact on wooden structures. These results improved our understanding of wildfire transition into WUI areas and fire performance of structural materials. Dr. Filkov's collaborations with the laboratory of the National Center of Scientific Research in France has resulted in some major findings in understanding thermal properties and smoldering of peat. Conclusive evidence that neither scale or peat origin has a strong effect on the kinetics of the drying process was found. The study represents a major contribution to this area and is an important step for predicting and modelling peat fires. Dr. Filkov has also collaborated with Worcester Polytechnic University (USA) and the University of Edinburg (UK) to conduct a series of pioneering experiments studying firebrand production and spotting mechanisms in wildfires. Several new methods were tested to describe the generation of firebrands at the experimental sites. The experiments provided unique quantitative data of firebrand distribution from wildfires. These experiments contributed to the development of new software for detecting the location of flying particles, and providing an estimate of the number and flux of firebrands generated by wildfire. Dr Filkov also studied the probability of fuel bed ignition by firebrands in laboratory experiments, resulting in the development of a mathematical model for the transport of firebrands from the combustion zone. This contributed to a better understanding of the generation, transportation and ignition

potential of firebrands during prescribed and wildfires. Since Dr. Filkov's arrival in Australia in 2016, his work has focused on understanding the mechanisms that drive dynamic behaviour in wildland and structural fires. He proposed a new scientific definition of dynamic fire behaviour (DFB) and a list of all known DFBs. This work provides unique quantitative data about DFBs and their classification, providing significant advances to our understanding of their importance in fire modelling. Dr Filkov's major findings and results include: testing Unmanned Aerial Vehicle technologies for measuring fire behavior in the field and potential application for fire management; the development of a novel system for a better representation of the dynamic heat fluxes of real fires under a laboratory conditions; proposal of a new method for testing fire performance of structural materials at small scales; and understanding flammability thresholds in Australian forests. Dr. Filkov serves as a Guest Editor of a Special Issue entitled "Experimentation and Physics-Based Modelling to Support Prescribed Burning" (journal Fire). He is also a reviewer for a number of journals including the International Journal of Wildland Fire, Fire Safety Journal, Fire Technology, Fire, Proceedings of the Combustion Institute, Combustion, Fuels, Energy and Fuels, Natural Hazards and Earth System Sciences, and Combustion Science and Technology. Dr Filkov has also mentored numerous graduate students, demonstrating his commitment to future generations of wildland fire researchers. He is currently co-supervising two PhD students at the University of Melbourne and Victoria University. Dr. Filkov is extremely passionate about wildland fire research and has demonstrated his commitment to the field. He has strong growth potential and he will continue to contribute greatly to the wildland fire community and to wildland fire science.

2021 Recipients

Dr. Cathelijne Stoof

The International Association of Wildland Fire (IAWF) Early Career Award in Fire Science is given to recognize a promising early-career professional who has demonstrated outstanding ability in any field of wildland fire science. Since its initiation in 2016, the award has been bestowed on five individuals. Selection of this award was based on open nominations. This year, a sub-committee comprising of seven fire scientists and managers from around the world with a wide variety of expertise and backgrounds evaluated each nominee in the areas of ability and impact, as well as their contribution to the diversity and inclusivity of the wildland fire science field. This year in particular, this award sub-committee faced a very challenging task as the nominees were all strong candidates. Two nominees, however, stood out in this highly competitive field. Unable to choose one over the other, the committee concluded that they were both incredibly deserving of this award, so this year, IAWF is awarding two Early Career Awards in Fire Science. This year's recipient of the IAWF Early Career Award in Fire Science is a highly versatile interdisciplinary researcher, already a leader in wildland fire science, and a role model for scientific communications and women in science. Her research ranges from the pore scale to the catchment scale, and spans the range from human impacts to rigorous study of underlying physical processes. Initially well known for her outstanding PhD work

on fire impact on soils, her research has now extended to environmental impacts, including greenhouse gas emissions, bioenergy, soil-water-plant ecology, and agronomy interactions. Based on her wide-ranging accomplishments, she received a prestigious Marie Curie Fellowship for her research and was shortlisted as one of 22 inspiring women at Wageningen University. She is well regarded and highly cited by the scientific community. Her publication record includes 117 journal and conference papers that, according to Google Scholar, have attracted already more than 1400 citations (at a current rate of 320 citations per year). The awardee's expertise in fire science is already in high demand. She has been instrumental in leading the scientific community, policy, and practitioners to recognize that climate change is impacting the fire regimes of countries that were previously considered 'safe' from wildfires. As part of this work she founded and leads the Wageningen Fire Centre to bring together researchers and stakeholders from various disciplines to tackle the diverse issues of fire within non-traditional fire prone countries. Most recently, she bought together and led a diverse group of academics and practitioners from across Europe to create a research proposal about her vision for living with fire. The project, called PyroLife, wants to tackle the increasing challenges of wildfire in Temperate and Mediterranean regions by bringing together a diverse set of disciplines (from engineers to ecologists to social scientists), all engaged in risk quantification, governance and risk communications, and the many disciplines in-between. As a result of this exceptional leadership and vision, her consortium PyroLife was awarded a €4 million grant in 2019 to train 15 PhD students from the Marie Curie International Training Network. In this way, her leadership will continue to guide and support the next generation of interdisciplinary fire scientists and their impact for decades to come. Just as importantly, this year's recipient has been a pioneer in fire science communications. She has excelled in creating public awareness for the soil and fire sciences by making a determined effort to engage the public in her research. She participates widely in TV programs (5), radio shows (10), and articles in popular scientific magazines, newspapers and on the web (>150) where she has worked on 3 continents. In addition to her day job, the awardee is heavily involved in supporting various international peer groups and learned societies, such as the soil science community of EGU where she has convened multiple session, or her involvement in IAWF as the Dutch member of EU Expert Group of Forest Fires. But of particular importance, she has been a strong advocate for equality and equity for underrepresented groups in fire science. She has been invited to give talks on the subject of diversity at several venues. She has also led this through more formal channels such as the 2019 letter in Nature entitled "Diversity helps to manage wildfires." These are all laudable endeavors where she puts her mind and heart and highlight the breadth of her skills and aims, and demonstrates her important role as an academic and young leader within the scientific community. For an early career scientist, her interdisciplinary approach, scientific accomplishments, social relevance and outreach activities in fire sciences are unparalleled in breadth and depth. She is a knowledgeable scientist who is always willing to share her insights with colleagues and who cheers on early career scientists to become confident and ambitious researchers themselves. It is with great pleasure that we announce that the 2021 IAWF Early Career Award in Fire Science goes to Dr. Cathelijne Stoof of the University of Wageningen. Congratulations Cathelijne!

Dr. Sayaka Suzuki

The International Association of Wildland Fire (IAWF) Early Career Award in Fire Science is given to recognize a promising early-career professional who has demonstrated outstanding ability in any field of wildland fire science. Since its initiation in 2016, the award has been bestowed on five individuals. Selection of this award was based on open nominations. This year, a sub-committee comprising of seven fire scientists and managers from around the world with a wide variety of expertise and backgrounds evaluated each nominee in the areas of ability and impact, as well as their contribution to the diversity and inclusivity of the wildland fire science field. This year in particular, this award sub-committee faced a very challenging task as the nominees were all strong candidates. Two nominees, however, stood out in this highly competitive field. Unable to choose one over the other, the committee concluded that they were both incredibly deserving of this award, so this year, IAWF is awarding two Early Career Awards in Fire Science. This year's recipient of the IAWF Early Career Award in Fire Science conducts crucial research for wildfire spread into and through communities, is a leader in linking the traditional building and wildland fire science communities together, and is a role model for women in the combustion and fire science fields. Though firebrands are a key factor in outdoor fire spread, such as Wildland-Urban Interface (WUI) fires, there has been little quantification of firebrand production from burning structures. More importantly, understanding firebrand production from burning structures over a range of scales has never been attempted prior to the awardee's groundbreaking research. The awardee engaged in complex research to quantify firebrand production from real-scale structure combustion, and then conducted a series of intricate experiments over reduced scales to determine if small scale experiments could provide insights into this complex problem. Hardy satisfied with only quantifying firebrand from burning structures, she also worked tirelessly to co-develop continuous-feed firebrand generators, both at reduced scale and full-scale. Both experimental devices, unique in the world, afford the generation of firebrand showers commensurate to burning structures and vegetation. Regarded as a leading expert in firebrands, the awardee has more than 30 journal papers focusing on understanding outdoor fire spread by firebrands, including a comprehensive overview on firebrand processes for *Progress in Energy and Combustion Science* (PECS). In November 2020, her research on this topic was featured in the journal *Science*. Her leadership in the bridging the gap between the traditional building and wildland fire science fields is demonstrated by her involvement in several projects. At the invitation of Springer Nature, an encyclopedia on wildland fires and WUI fires was developed starting in 2016 and was published in 2020. The awardee was the key person to invite from Asia as a section editor (SE) on this gargantuan undertaking. The first edition of the encyclopedia contains 171 contributions, written by more 200 authors from all over the globe. So, far it has been downloaded more than 48,000 times and 200 tweets from 145 users reaching more than 341,163 followers. Further evidence of her leadership is her role as the main liaison for the workshop series known as Operation Tomodachi – Fire Research. Tomodachi means friendship in Japanese. In her role in this workshop series, she served to bridge the vast

cultural differences as well as communication difficulties between USA and Japanese fire researchers. This workshop is documented in a special issue in Fire Technology that she co-guest edited. Currently, she serves as co-leader on the IAFSS permanent working group known as Large Outdoor Fires and the Built Environment (LOF&BE), which has over 150 members from 25 countries. Other editorial service includes guest editor for *Combustion Science and Technology* and *Frontiers in Mechanical Engineering*, all on large outdoor fires. Women are an underrepresented group in fire and combustion research, and in Japan especially, there are only a limited number of women engaged in fire safety science research. As a board member of the Japanese Combustion Society, she is making headways into recruiting more women researchers in fire research in Japan. She has led the development of young researcher workshops at their annual meetings and also hosts luncheons where young women can join and discuss how a career in fire research can be rewarding. It is with great pleasure that I announce that the 2021 IAWF Early Career Award in Fire Science goes to Dr. Sayaka Suzuki of the National Research Institute of Fire and Disaster (NRIFD), Japan. Congratulations Sayaka!