Nikolai Dotzek Award

The Nikolai Dotzek Award is the most prestigious award in the global severe weather research community.

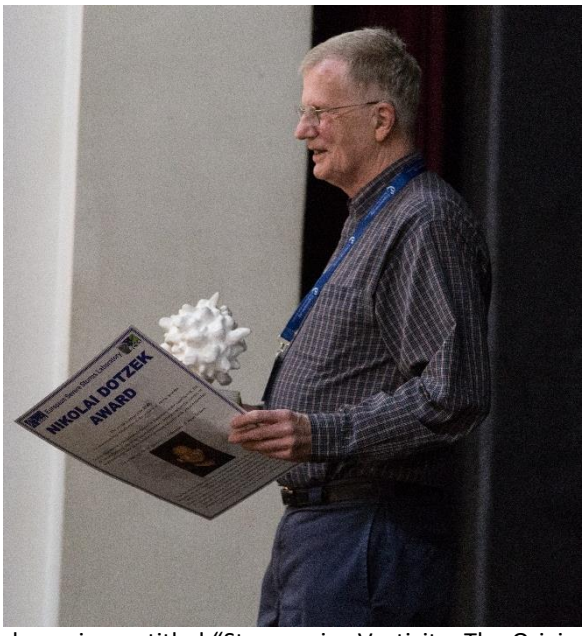
The award is presented at each European Conference on Severe Storms, starting in 2011, **for *an outstanding contribution to the science of severe storms***. The award may be given for a breakthrough discovery presented at the conference, for an accumulation of important accomplishments during a scientific career, or as an encouragement to an outstanding young scientist with great potential. The award may also be given for a combination of these factors.

The list of awardees:

2011	Dr. Paul M. Markowski, Pennsylvania State University State College, USA	*At the 6th European Conference on Severe Storms in Palma de Mallorca, Dr. Paul Markowski was awarded the first Nikolai Dotzek Award by the ESSL Executive Board for his recent pioneering research in the field of numerical modelling tornado genesis.*  Contgratulations to the Nikolai Dotzek Award winner (in the middle with the trophy in hands), photo © Magdalena Pichler
2013	Dr. Charles A. Doswell III, Norman, Oklahoma, USA	*At the 7th European Conference on Severe Storms in Helsinki, Dr. Charles A. Doswell III was awarded the second Nikolai Dotzek Award by the ESSL Executive Board for his lifetime achievement, such as* *- studying how to use observed meteorological data such as surface observations and radiosonde data in forecasting operations* *- investigating the role of humans in forecasting* *- examining public awareness of severe weather events* *- using climatological records to put severe weather outbreaks in historical perspective, while pointing out the limitations of such records* *- stimulating the European meteorological community to take forecasting and studying convective storms seriously* *and especially,* *- demonstrating that forecasting severe convective hazards is best done by focusing on ingredients, in the absence of which storms cannot form.*

		 *Dr. Charles A. Doswell III (Nikolai Dotzek Award winner), Dr. Pieter Groenemeijer (ESSL Director) and Dr. Kathrin Riemann-Campe (ESSL Deputy Director), photo © Pauli Jokinen*
2015	Dr. Harold E. Brooks, USA	*At the 8th European Conference on Severe Storms in Helsinki, Dr. Harold Edward Brooks was awarded the third Nikolai Dotzek Award by the ESSL Executive Board. Dr. Brooks has been given the award for his innumerable and diverse contributions to the science of severe storms, which among many other accomplishments, include* *- his pioneering work in developing and applying proxy parameters to assess the climatology and risk of severe storms, both regional and global.* *- his contributions in establishing the connection between vertical wind shear in the lower troposphere and the occurrence of tornadoes.* *- his extensive work and significant progress on verification methods for forecasts of extreme events.* *In addition, Dr. Brooks was commended for his support to the European and international communities of severe storm researchers that has resulted in many fruitful collaborations.*  *Dr. Harold E. Brooks (Nikolai Dotzek Award winner 2015), Dr. Pieter Groenemeijer (ESSL Director) and Alois M. Holzer (ESSL Director of Operations) from left to right, at the ECSS awarding ceremony in Wiener Neustadt, Austria, photo © Thomas Schreiner.* *Dr. Brooks is affiliated with the NSSL in Norman, Oklahoma.*

2017	Dr. Joshua Michael Aaron Ryder Wurman	*At the 9th European Conference on Severe Storms in Pula, Croatia, Dr. Josh Wurman was awarded the fourth Nikolai Dotzek Award by the ESSL Executive Board. Dr. Wurman has been given the award for* • his work on radar techniques including bistatic radar and mobile radars, • his groundbreaking work in developing the Doppler-on-Wheels radars that were first operated in the large field program VORTEX in the mid 1990's, • the outstanding research he has done with the Doppler-on-Wheels and the work which supervised: This research has revealed the structure of flow in tornadoes in extreme detail; it has also contributed to important new insight into the immediate environment of tornadoes, and into other weather phenomena that the DoWs have scanned around the world. The scientific community owes a lot to Dr. Josh Wurman for creating an abundance of research opportunities with the Doppler-on-Wheels data, and for having inspired many future researchers around the world.  *Dr. Joshua Wurman (Nikolai Dotzek Award winner 2017), Dr. Pieter Groenemeijer (ESSL Director) and Dr. Kathrin Riemann-Campe (ESSL Deputy Director) from right to left, at the ECSS awarding ceremony in Pula, Croatia. Photo © Thomas Schreiner.* *Dr. Wurman is affiliated with the Center for Severe Weather Research in Boulder, Colorado, USA.*

2019	**Dr. Robert Davies-Jones**	*At the 10th European Conference on Severe Storms in Krakow, Poland, Dr. Robert Davies-Jones was awarded the fifth Nikolai Dotzek Award by the ESSL Executive Board. Dr. Davies-Jones has been given the award for his lifetime achievement: He is one of the founders of the modern theoretical description of supercell thunderstorms. Although he is perhaps best known for his contributions on supercell and tornado dynamics, he also has advanced the field of large-scale dynamics and made numerous contributions on basic fluid physics (often centered on one of the most important quantities to analyze tornadoes: vorticity).*  Davies-Jones during the giving ceremony of the Nikolai Dotzek Award at the ECSS conference dinner in Krakow, Poland, on 6 November 2019. Having a background in solar physics, Bob joined the National Severe Storms Laboratory in 1970 where, among other topics, he did research on dual-Doppler networks. The results of this research are now common knowledge and the basis of today's designs of such networks. In 1984, he authored one of the most seminal work on supercell dynamics, entitled "Streamwise Vorticity: The Origin of Updraft Rotation in Supercell Storms," which has been cited over 420 times. In that paper he derived expressions for the covariance between updraft and vertical vorticity for general wind profiles, and introduced storm-relative helicity (SRH) as a potentially useful tool to predict supercells and tornadoes. SRH is now one of the most important kinematic parameters used across the globe to identify the potential for supercells. Also in the early 1980s, he probably was the first to argue that tornadogenesis required a downdraft, or else vertical vorticity could not develop very close to the surface. This idea was further explored in an important contribution in 1993, where he and his coauthor, Harold Brooks (Nikolai Dotzek Awardee 2015), analyzed how vertical vorticity along trajectories changes sign from negative to positive while the air is still descending. This mechanism is now commonly referred to as the DJB mechanism and appears to be the most fundamental way by which real-world convective storms initially develop near-surface rotation. Further, Bob applied a vorticity decomposition theorem by J. Dutton to highly idealized flows that mimic certain storm features, for which he obtained analytical results. He was thus able to demonstrate in detail how descending air acquired positive vertical vorticity, which may subsequently be stretched to produce a tornado. He also offered in-depth analyses of linear and nonlinear propagation of supercells. Although working through Bob's papers usually takes some effort, the reader is always rewarded with a deeper understanding, and left with a sense of beauty, of storm dynamics. Perhaps less known in the severe-storms community, Bob has also made substantial contributions in the field of synoptic-scale dynamics. By leveraging formal similarities between the Q-vector and the tilting/stretching terms of the vorticity equation, he found that the Q-vector may also be interpreted as the rate at which the vorticity associated with the thermal wind is rearranged, and identified the constraint of PV conservation as the reason that the geostrophic balance flow to destroy itself. He also obtained generalizations of the Q-vector to diagnose the 3D ageostrophic circulation, and he introduced the "alternative balance" to improve some of the shortcomings of the traditional quasigeostrophic theory.
2023	**Wang, Setvàk and Bedka**	**The Nikolai Dotzek Award 2023 goes to three meteorologists with focus on satellite studies. The most prestigious award in the global severe weather research community is presented every second year in the memory of ESSL's founding father, Dr. Nikolai Dotzek, for an outstanding contribution to the science of severe storms.**

2023	**Pao Wang, Martin Setvák and Kris Bedka**	As the new generation of satellites in Europe, the United States, and Japan have been launched, their increased capabilities in terms of available channels and resolution will allow for better nowcasting of severe convective storms. It is a good time to acknowledge those who have contributed significantly to our understanding of the processes that occur on top of the convective storms, how they relate to storm severity, and how they can be operationally detected. We present the 2023 Nikolai Dotzek Award to three scientists who have strongly pushed satellite meteorology forward. **Pao Wang** The first awardee is Prof. Pao-Kuan Wang, who has used very high-resolution cloud models to simulate the processes at the top of convective storms. Simulations showed that overshooting tops act as obstacles to the anvil-relative wind. Thus, most of the storm top features that we observe from a satellite, such as cold rings, cold-Us, above-anvil cirrus plumes, storm-top gravity waves or ship wave patterns result from the interaction between overshooting tops and the ambient flow. Wang has also shown that some of these features result from internal gravity wave breaking processes, consequently contributing to lower stratospheric moistening. Wang was, until recently, director of the Research Center for Environmental Changes of the Academia Sinica and formerly professor at the University of Wisconsin in Madison. **Martin Setvák** The second awardee is Dr. Martin Setvák, who in the late 1980's described various forms of increased 3.7 micron cloud top reflectivity of convective storms and discussed its possible link to storm severity and updraft strength. Later he elaborated this concept with Dr. Charles A. Doswell. Together with Dr. Vincenzo Levizanni, Setvák formulated a concept of above-anvil cirrus plumes above convective storms on satellite imagery. He also contributed to the categorization of various storm-top phenomena, such as cold rings, closely collaborating on these topics with Prof. Pao K. Wang. Setvák is the father of the so-called “sandwich imagery”, a combination of infrared and visible channels, which is now in widespread use across the world. Setvák was affiliated with the Czech Hydrometeorological Institute (CHMI) and is now retired. **Kris Bedka** The third awardee is Kristopher Bedka, who together with his team made significant strides toward the automation of the detection of both overshooting tops and above-anvil cirrus plumes. Using large records of these phenomena and their properties, Bedka investigated their statistical relationships with severe weather beneath them. His recent work concentrated on the automatic detection of high ice water content in deep convective storms, adversely impacting aircraft engine and air probe performance. He demonstrated the utility of 1-min super rapid scanning for analysis of satellite-observed cloud properties. His ongoing work expands towards wind profiling with an airborne doppler aerosol lidar - to only mention one of several fields of activity - and offers great promises for nowcasting and improving severe storms climatologies. Kris Bedka is affiliated with the NASA Langley Research Center.

The Nikolai Dotzek award was instigated in 2011 in the memory of ESSL's first director and founding father, Dr. Nikolai Dotzek, who passed away in May 2010. He was a binding factor within the European community of severe storms scientists well before ESSL's foundation in 2006 and is remembered for his innumerable efforts to promote European collaboration in the field. His ultimate aim was to increase the understanding of severe storms and tornadoes, to assess the risk they pose, and to create awareness for their existence and thus increase society's resilience to them.

Dr. Nikolai Dotzek and the trophy (version of 2011)

The Nikolai Dotzek Award is a trophy that represents a massive hailstone, which is made out of artificial resin, and a certificate. Besides this, the winner will receive 1000 Euro and a fee waiver for the European Conference on Severe Storms.