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In memoriam

In Memory of Dr. Inga Lisac, the first Editor-in-Chief of Geofizika (Novi Marof, 1930 – Zagreb, 2015)

On 20 March 2015, we lost a teacher, colleague and dear friend, Dr. Inga Lisac. Inga was born in Novi Marof, northern Croatia, on 13 December 1930, as the only child of a lawyer, Pavao Lisac, and a nurse and social worker, Vlasta (nee Sabljak). Her mother, Vlasta, descended from the respectable Fleischer family, which contributed to the cultural and educational life of the town of Bjelovar throughout the 19th and the early 20th century (Lisac, 2007).

After finishing high school in Zagreb in 1949, Inga studied at the University of Zagreb, Faculty of Science, as one of the earliest students of Geophysics with Meteorology in Croatia (this study was established in the academic year 1947/48, and the first student graduated in 1951). In 1953, she defended her graduation thesis 'Fog, formation and types, with a short overview of fog in Zagreb', which was written under the supervision of Prof. Josip Goldberg of the Geophysical Institute (which now belongs to the Department of Geophysics, Faculty of Science, University of Zagreb). She earned both MSc and PhD degrees at the same university under the supervision of professors of the Geophysical Institute. In 1966, Inga completed her MSc thesis 'Influence of the Medvednica Mountain on the airflow above Zagreb' (mentor Branko Maksić), and she received her doctoral degree after defending her thesis entitled 'A contribution to the knowledge of the structure of surface airflow in Zagreb' (mentor Berislav Makjanić) in 1978 (Orlić *et a*l., 2011).

From 1953 until 1960, Inga was employed at the Hydrometeorological Service of the People's Republic of Croatia (now the Meteorological and Hydrological Service of Croatia), first as a meteorological intern in the synoptic section and later as the head of the aerological station Zagreb-Maksimir. Between 1961 and 1973, she served as a research assistant at the Institute of Atmospheric and Cosmic Physics of the Yugoslav Academy of Sciences and Arts (now the Croatian Academy of Sciences and Arts), and in 1974, she joined the Geophysical Institute as an assistant. In 1984, she was promoted to assistant professor, and she remained in that position until her retirement in 1997.

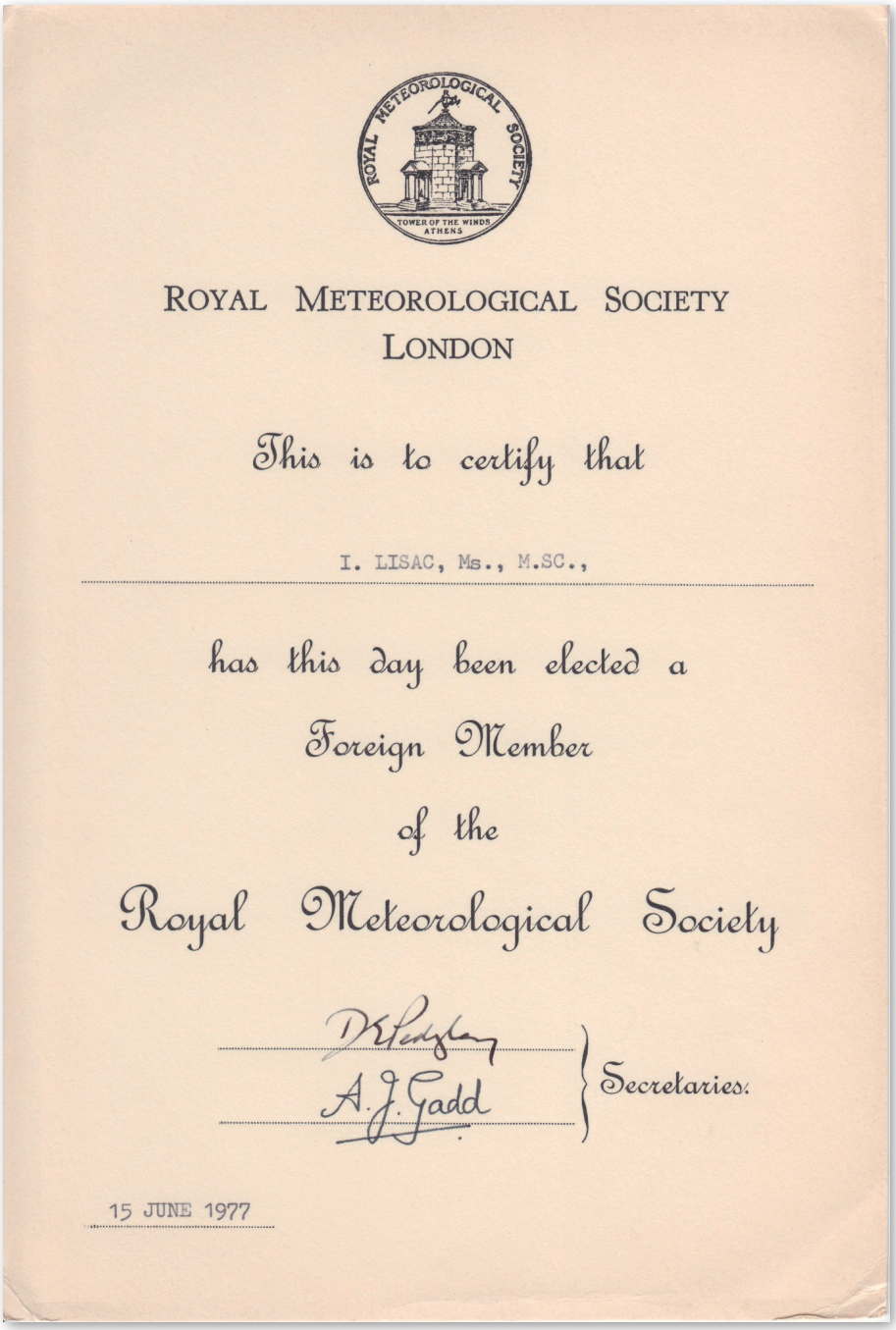
Inga at a young age.

As a teacher, Inga taught atmospheric science courses for graduate and post-graduate students of the Department of Geophysics and courses in meteorology with climatology for graduate students of other departments of the Faculty of Science. She also conducted practicums, exercises and seminars in meteorological and climatological courses at the Department of Geophysics and supervised eight students while they were working on their graduation theses (Orlić et al., 2011). I still remember her seminar topic on acid rain, which I chose as a graduate student in meteorology in the early 1980s. It attracted me to atmospheric pollution issues and, in a way, gave direction to my future scientific development.

Inga approached atmospheric science with enthusiasm and excitement, and she was always willing to tackle new issues with great passion, no matter how unfavorable the working conditions. Namely, the majority of her formally active

Retirement party held for Prof. Mokrović of the Geophysical Institute on 13 December 1968. Sitting (from the left): Inga Lisac, Josip Mokrović, and Ivka Frangeš (Biškupović). Standing (from the left): Božena Volarić, Branka Penzar, and Rajka Gugić.

years was associated with poor funding, limited availability of professional literature and equipment, and accordingly, insufficient cooperation with the international scientific community. Nevertheless, Inga made an effort to establish professional connections with scientists from abroad by staying at the Central Institute for Meteorology and Geodynamics (*Zentralanstalt für Meteorologie und Geodynamik*), Vienna, Austria, and the Free University of Berlin, Institute of Meteorology and Geophysics (*Freie Universität Berlin, Institut für Meteorologie und Geophysik*), Germany in 1960 (Lisac, 1961), the Polish Academy of Sciences, Geographical Institute, Climatological Section, Warsaw in 1967, and Utah State University, Department of Soil Science and Biometeorology, Logan, USA from 1970 to 1973 (Orlić et al., 2011), which was not altogether common at the time. She also joined foreign professional associations, such as the Royal Meteorological Society and the National Geographic Society long ago. All of this international activity not only facilitated her scientific development but also helped her to perceive what where, at that time, hot topics in atmospheric science, to obtain a photocopy of a photocopy of a photocopy of some interesting scientific paper, which she generously shared with her colleagues, or to connect domestic researchers with foreign scientists. I personally owe her a debt of gratitude for writing a letter of recommendation to Dr. Anton Eliassen that helped me to obtain a scholarship and join the EMEP (Eliassen and Saltbones, 1983) modeling group in 1987, which further deepened my involvement in air pollution issues (e.g., Klaić, 1990).



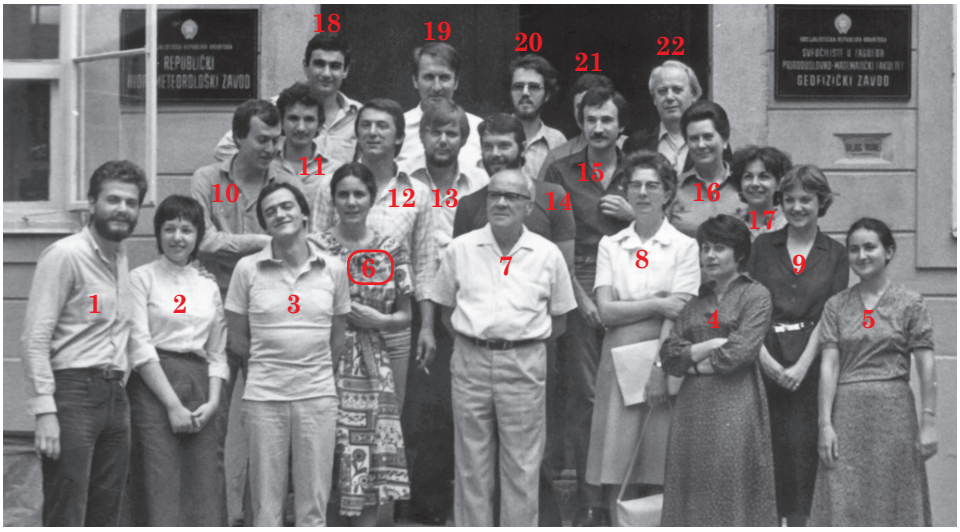
Inga's membership certificate from the Royal Meteorological Society from 1977.

Among Inga's wide-ranging scientific interests, several major topics stand out. One of these was aeronomy, the field in which she was the most productive. She particularly focused on atmospheric ozone and/or ultraviolet (UV) radiation (papers [2], [6], [9]–[10], [22]–[23], [25]–[28], [30], [50], [53]–[57], [59], and [75]–[76]), among which her paper [10] on ozone measurements carried out in Zagreb at the end of 19th century was quite remarkable. However, she also addressed the *Aurora Borealis* (papers [1], [5], [42], [46], and [48]–[49]), and various other issues (papers [43], [47], [52], [60], and [74]). She was also involved in the acquisition of two instruments for observations of UV radiation (a Scintec sensor supported by a Young data logger and a UV-Biometer manufactured by the Solar Light Company, the latter of which was purchased after her formal retirement). The second topic was climate research - particularly in association with airflow (as in her master and doctoral theses and papers [4], [8], [13]–[14], [16]–[18], [34]–[36], [38]–[39], and [65]). Other climate studies addressed the annual variations of temperature over Croatia (paper [15]), the climate of Sisak (paper [7]), solar radiation components (papers [20]–[21], and [69]), visibility (paper [41]), summertime precipitation (paper [67]), and climate variability (paper [24]). The next topic that was the focus of her interest was precipitation acidity (papers [11]–[12], [19], [32]–[33], [40], and [63]). In the late 1960s, Inga managed to procure a pH meter equipped with a glass electrode and referent calomel electrode, and in 1980, she procured a portable transistor pH meter with one, combined electrode (Lisac, 1986a). She organized and performed pH measurements of daily precipitation samples collected at three different locations in Zagreb for over seventeen years, starting in 1969 (Klaić and Lisac, 1988). During this period, she was measuring precipitation pH mainly by herself, with only occasional help and with no special funds assigned to this activity. Inga was also engaged with the history of science in Croatia, mostly the development of meteorology and the achievements of meritorious meteorologists (Andrija Mohorovičić, Stjepan Škreb and Josip Goldberg) who were active between the end of 19th century and the 1950s (papers [29], [37], [51], [61], and [64]). However, the two most recent papers belonging to this group (papers [1] and [42]) addressed the Croatian scientist and philosopher of 18th century, Ruđer Josip Bošković, and his explanation of *Aurora Borealis* phenomenon. Finally, her remaining contributions (publications [3], [31], [44]–[45], [58], [62], [66], [68], and [70]–[73]) were of various types (such as scientific, professional and popular papers, reports on professional visits and meeting attendance, and a book review) and addressed various earth science themes.

In 1984, the Geophysical Institute launched the new journal *Geofizika* and elected Inga as the first Editor-in-Chief. She remained in this position until the end of 1989, editing a total of six volumes. The new journal, which succeeded the former Geophysical Institute publication *Radovi* (launched in 1923 but was issued sporadically), was aimed at research in atmospheric physics, the physics of the ocean, and the physics of the Earth's interior (Lisac, 1984). From the very beginning, the editorial policy was to produce a high-quality, internationally

recognized journal with international reviewers and authors. Thus, in the first editor's acknowledgement to the reviewers (Lisac, 1986b), reviewers from the USA and, at that time, the Federal Republic of Germany and the German Democratic Republic, were acknowledged, and the first foreign contribution – a paper on dynamic of the planetary boundary layer by Wooldridge and McIntyre II – was published in 1986 (Wooldridge and McIntyre II, 1986).

In addition to scientific and teaching engagements, Inga invested great effort in the popularization of meteorology. In addition to writing popular papers and designing brochures, she participated in the activities of the Croatian Meteorological Society. One of these was named 'Brač Island Breeze' (*Brački povjetarac*). This activity, which began in 1993, was initiated and conducted for over a decade by Ivo Lukšić of the Meteorological and Hydrological Service of Croatia. Volunteers (students of primary and secondary schools) were instructed in meteorological instruments and methods of observation, and afterwards, during the summertime, they observed cloudiness, surface wind speed and strength, surface air temperature and wet-bulb temperature. Additionally, they observed upper level winds using hydrogen filled balloons and theodolite (Lukšić, 2000, 2002, 2003). This activity served educational and promotional purposes, but it also resulted in a large meteorological database available for the investigation of the summertime wind regime of the Island of Brač.



Inga with other employees and students of the Geophysical Institute in 1978: 1 – Srećko Bandalo, 2 – Nada Dizdarević (Bandalo), 3 –Željko Blagojević, 4 – Jelka Mikulić, 5 – Đurđa Birek (Belec), 6 – Inga Lisac, 7 – Marijan Kasumović, 8 – Branka Penzar, 9 – Željka Bajić (Bušurelo), 10 – Zoran Rebac, 11 – Krešo Pandžić, 12 – Zlatko Đurić, 13 – Matko Nađ, 14 – Jovan Orešćanin, 15 – Branko Cividini, 16 – Božena Volarić, 17 – Višnjica Brebrić (Vučetić), 18 – Jurica Miljak, 19 – Josip Juras, 20 – Dušan Bižić, 21 – Miroslav Fančović and 22 – Berislav Makjanić.

Inga with other employees and guests of the Geophysical Institute in 1987: 1 – Albert Juhanjan, 2 – Dragutin Skoko, 3 – Franjo Margetić, 4 – Zvjezdana Klaić, 5 – Pavle Bradarić, 6 – Lovorka Sokolić, 7 – Ivan Penzar, 8 – Mirko Orlić, 9 – Radovan Capar, 10 – Nadežda Šinik, 11 – Alojzije Igrec, 12 – Zdenko Frelih, 13 – Inga Lisac, 14 – Tomislav Kovačić, 15 – Krešimir Marić, 16 – Ivo Allegretti, and, 17 – Zlatko Matica.

Inga next to the first automatic meteorological station of the Geophysical Institute (end of the 1980s).

After her formal retirement in 1997, Inga did not lose her enthusiasm and excitement for scientific and professional work. She continued looking ahead, developing new ideas and plans for future activities, and remained active in research and writing. Thus, during that period, she published five papers in peer-reviewed journals, eight conference papers, sixteen professional papers and one book chapter (papers [1]–[5], [22]–[29], [42]–[57], and the book chapter [74], respectively), with the most recent publication being in 2013. In addition, she continued to be active in the Croatian Meteorological Society, where in 2005, she obtained a recognition award for her notable contribution to Society activities. Likewise, she continued to attend our weekly seminars at the Geophysical Institute, where she exhibited her broad knowledge while actively participating in discussions; as our colleague Zoran Pasarić commented on several occasions, 'she always asks the right questions'.

Today, with the expanding number of scientists (e.g., Schatz, 2014) and publications (e.g., Larsen and von Ins, 2010; Sakr and Alomari, 2011), together with the increased pressure to amass papers (Yank and Barnes, 2003) also known as 'publish or perish' syndrome (e.g., Aragón, 2013; Schatz, 2014) and the consequent paper inflation (e.g., Aragón, 2013), as well as the rapid information exchange, high international mobility of researchers, teachers, and students (e.g., Teichler, 2015), and the growing demands to collaborate with non-academic organizations and commercialize academic knowledge (e.g., Hammerstedt and Blach, 2008; Rasmussen, 2008; Perkman et al., 2013; Erkison et al., 2015), Inga's achievements may appear modest. To put it another way, by quoting Schatz (2014): 'No wonder that we have become myopic for past achievements in science...Little Science has become Big Science and has changed its soul.' Although Inga quickly adopted new technologies as they emerged, her formally active years belonged mainly to the 'Little Science' period, before the Internet and the use of e-mail, when all information and scientific communication with foreign colleagues was conducted through postal mail. Therefore, we are even more grateful to her for the enormous amount of energy she dedicated to paving new ways and for devoting her life to the progress of the Geophysical Institute and *Geofizika* journal.

We will also remember her as a cheerful, warm, generous person involved in a number of philanthropic initiatives, particularly during the 1990s war and post-war period, for which she was explicitly acknowledged.

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