Foreword

It is a great pleasure to celebrate the 75th birthday of Professor Dr. phil. Johann Fischer with this body of work in a Special Issue of Molecular Physics. Numerous warmhearted responses that we have received during the organization of this issue are testament to the great respect that he has earned as a person. The contributors to this issue reflect the broad influence Johann Fischer's work had on the scientific community, representing a wide field ranging from fundamental Statistical Thermodynamics to applications in Engineering.

Born on August 31, 1942 in Amsterdam, at age five Johann Fischer's family relocated to Wien (Vienna), where he spent most of his youth. After graduating from secondary school in 1960, he entered into studies in Physics and Mathematics at Universität Wien to become a teacher. He was awarded a Fellowship of the French Government at that time. In 1966 he became Scientific Coworker at the Institut für Physikalische Chemie, Universität Wien. His dissertation on cell theory for liquids was supervised by Professor Dr. Friedrich Kohler, which he defended in 1971. Shortly after, he became Assistant Professor at the Institut für Theoretische Physik, Ruhr-Universität Bochum. It was through this appointment and his contact to Professor Dr. Gerhard H. Findenegg that he began research on molecular modeling of fluids at walls. It was an unusual event that the doctoral advisor followed the student from Wien to Bochum with the result that Johann Fischer became Akademischer Rat at the Institut für Thermo- und Fluiddynamik, Ruhr-Universität Bochum in 1977. Once more, Professor Kohler became Johann Fischer's mentor; this time for his Habilitation thesis in Statistical Thermodynamics of fluids in equilibrium at interfaces, which he defended in 1981. Five years later he was promoted to Professor. In 1994, he accepted a call to become Professor of Mechanical and Energy Engineering at Universität für Bodenkultur Wien. There, he headed the Institut für Verfahrens- und Energietechnik from 2004 until his retirement in 2008. Since then, he has been actively conducting research as Professor Emeritus.

Johann Fischer married Ruth Pollmann in 1969. Their daughter Eva was born 1971 in Wien and their son Christian 1974 in Bochum. Eva currently lives in Melbourne and Christian in Innsbruck.

Johann Fischer and his collaborators have authored 127 peer-reviewed papers in prestigious international journals to date; 25 of which are in Molecular Physics. He began publishing in 1967 about the cell theory of liquids. He posited broad fundamentals through his contributions to the book "The Liquid State" by Friedrich Kohler, which appeared in 1972. His broadness is reflected by numerous publications in varying fields; such as electrophoresis, group contribution theory of mixtures and hard body thermodynamics.

From 1975 throughout his career, Johann Fischer worked on various aspects of Adsorption, employing different approaches; such as integral equations, density functional theory and molecular simulation. One particular interest originates in 1979, spanning and over almost two decades. Here he contributed significantly to the fundamentals of perturbation theory for molecular liquids and their mixtures, including predictions of vapor-liquid equilibria.

The strongly theory oriented Johann Fischer was initially quite skeptical about molecular simulation. However, in the mid 1980's, he became more open toward this emerging new tool, to which later he should contribute significantly both fundamentally and practically. Johann Fischer was the first scientist in Germany who gave graduate students in Engineering the opportunity to work in this unfamiliar field, which at that time was seen by many with skepticism. All three of us were involved in that crucial period of change and benefitted greatly. Johann Fischer has applied the statistical approach to the thermodynamic properties of many compounds and their mixtures (e.g. natural gases and refrigerants). Special attention was given to improvements of combining rules in molecular mixtures.

An important methodological achievement was the NpT + test particle method, which was published in 1990 for the molecular simulation of vapor-liquid equilibria by the group of Johann Fischer. Results for the Lennard-Jones system from 1992 are still ultimate standard for accuracy. That method was extended then to binary and ternary

mixtures. In parallel, he worked on vapor-liquid equilibrium simulations of phases in direct physical contact; a topic that he followed in different forms until today.

The power of molecular modeling and simulation gave rise to physically based equations of state, which Johann Fischer has pursued over two decades. He has refined the Boublík-Alder-Chen-Kreglewski (BACK) equation of state family, where the different physical interactions are explicitly considered. He has applied such equations to many engineering related systems with great success.

Johann Fischer's second relocation to Wien was associated with a transition to more energy technology related activities. Here, equations of state play a crucial role. Of special interest are his accomplishments on the organic Rankine cycle to convert heat to work. His most recent seminal theoretical publications about the selection of working fluids for this process are among the top cited in this field.

As Johann Fischer's students, we very much enjoyed his thoughtfulness and patience while dedicating himself to work with us finding solutions to intricate problems. The blend of his origins in teaching and his expertise in science lead to perfect learning environments and student teacher relationships. We recall going with him through stacks of dot matrix printer paper containing running averages of molecular simulation results. Johann Fischer taught us about careful scientific work by meticulously examining data in search of gems and glitches. The sharp point of his pencil was always in motion. Many of his close collaborators remember his many pages of output that were collages of golf-ball typewriter text, handwritten notes and sketches glued together in A4 format. Today, he has managed to transfer much of this style to emails.

Johann Fischer's 14 doctoral students and numerous other group members extensively discussed under his auspices a wide variety of topics beyond their scientific endeavors, with history and politics being prominent among them. The knowledgeable and open minded atmosphere Johann Fischer created was inspiring to many, whether they be locals or visitors from abroad. He freely shares his scientific world view with visitors, colleagues, and students from many corners of the globe with open arms, regardless of their academic status. His hospitality and generosity is regarded with deep appreciation and is reflected by the present body of work.

Deeply thankful for his guidance, we wish Johann Fischer fruitful and good times ahead.

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Rolf Lustig, Carlos Vega and Jadran Vrabec