



**Geological Society of America  
Structural Geology & Tectonics Division**

**2015  
Outstanding Publication Award  
Presented to Konstanze Stübner and co-authors**

Stübner, K., Ratschbacher, L., Rutte, D., Stanek, K., Minaev, V., Weisinger, M., Gloaguen, R., & Project TIPAGE members (2013) *The giant Shakh dara migmatitic gneiss dome, Pamir, India-Asia collision zone: 1. Geometry and kinematics*. Tectonics 32, 948-979.

Stübner, K., Ratschbacher, L., Weise C., Chow, J., Hofmann, J., Khan, J., Rutte, D., Sperner, B., Pfänder, J.A., Hacker, B.R., Dunkl, I., Tichomirowa, M., Stearns, M.A., & Project TIPAGE members (2013) *The giant Shakh dara migmatitic gneiss dome, Pamir, India-Asia collision zone: 1. Timing of dome formation*. Tectonics 32, 1-28.

*Citation by Christian Teyssier*

Konstanze Stübner and co-authors are the recipients of the 2015 Outstanding Publication Award for two companion papers published in Tectonics - "The giant Shakh dara migmatitic gneiss dome, Pamir, India-Asia collision zone: 1. Geometry and kinematics and 2. Timing of dome formation". These monumental papers are based on extensive fieldwork that was conducted in some of the most rugged terrains in the world. The authors explain, with careful documentation and unusual clarity, how partially molten crust reached the Earth's surface and formed a giant dome the size of Switzerland. In the paper dedicated to geometry and kinematics Stübner and coauthors present a magnificent geologic map accompanied by a set of detailed cross-sections. They document structures from brittle to ductile and conduct strain and kinematic analyses based on fault populations, foliation-lineation patterns, and mineral preferred orientations. In the companion paper, Stübner and co-authors date melt crystallization as Early Miocene (using high-temperature U-Pb geochronology) and track the progressive cooling of dome rocks using thermochronology methods down to less than 100°C. This geochronology work characteristically includes a very large number of samples that were chosen strategically inside and outside the dome to test hypotheses on the mode of formation and emplacement of dome rocks and to construct age-elevation profiles from which exhumation rates are interpreted. The dome was progressively exhumed from beneath a detachment zone that accommodated about 100 km of extensional displacement at a rate of 1 cm/yr, all this in the context of India-Asia convergence. This work gives new meaning to gravitational collapse of orogens and poses new questions on the type of deep crustal flow that must be compatible with upper crustal tectonics. In addition, this work is an excellent example of interdisciplinary collaboration that resulted from collecting and analyzing the field data. That so much science was condensed into the two papers being

celebrated today is nothing short of a tour de force that demonstrates the leadership and scientific acumen of the lead authors. The results of this work are opening new areas of inquiry for understanding how orogenic processes link from surface to depth and how orogens reflect a delicate balance between tectonic forces, surface processes, and climate patterns. Konstanze, I am grateful that you could be here today, and on behalf of the Division I congratulate you and your co-authors for this excellent piece of work.

*Response by Konstanze Stübner*

It is a great honor that our papers were selected as Outstanding Publications, and on behalf of myself and my coauthors I wish to thank the Structural Geology and Tectonics Division and the Committee for this award. I am particularly grateful to Christian Teyssier for his nomination and gracious citation. The two papers are the result of many years of work in the field and in the lab by a large group of international colleagues with different

scientific background. I am very pleased that the committee recognizes this interdisciplinary collaboration, and I would like to extend my gratitude to all the coauthors that have contributed to this work.

When I first started working in the Pamir mountains in 2006, the large metamorphic outcrops in southwest Tajikistan and northern Afghanistan were considered fragments of a Precambrian microcontinent, and our understanding of Pamir geology has come a long way since then. The beginning of this project is at least ten years earlier, when my PhD advisor and coauthor Lothar Ratschbacher first started working in Tajikistan, established contacts to Russian and Tajik geologists in Dushanbe, and laid the scientific groundwork for this study. During the 1990s, the political and financial situation in Tajikistan after the fall of the Soviet union was challenging, and in many respects it still is. Without the continuous logistic support of our Tajik collaborators none of this work would have been possible. In particular, I want to thank Vladislav Minaev and Negmat Rajabov, who have organized much of the field work logistics, but also the students that have accompanied us, Mustafo and Ilhomjon.

But more important than the logistic support, I want to emphasize the scientific contributions of Tajik and Russian geologists during Soviet times: Teams around Vladislav Minaev and the late Victor Dronov, who I have never had the chance to meet in person, produced brilliant and meticulous geologic maps of the high mountains of Pamir and Hindu Kush. With stunning attention to detail they mapped even the most remote outcrops in this difficult terrain, and our papers are in part their heritage.

The award committee commends the collaborative nature of our work, and I want to use this opportunity to thank all the teams that are involved in the Pamir research focus. The long list of collaborators includes Brad Hacker and his colleagues and students from UC Santa Barbara, who unraveled the metamorphic paths of basement rocks, many researchers and students from the work group of Lothar Ratschbacher, TU Bergakademie Freiberg, who assisted in the field and

with analytical work, and a large team of geophysicists from Geoforschungszentrum Potsdam, whose experimental data and numerical models inspired some of our interpretations. I have been fortunate to work with so many colleagues from different disciplines.

The papers result from 5 years of detailed structural mapping, and the geochronology part comprises more than 200 samples. This approach is certainly not the most efficient way to achieve a copious publication record in a short amount of time. It is therefore particularly gratifying that the Structural Geology and Tectonics Division recognizes our group effort in this way. I am pleased to learn that the community acknowledges the impact of our work. Thank you very much.