Like all box jellyfish *Tripedalia cystophora* carries an elaborate visual system comprising 24 eyes of four morphological types. However, little is known about how the visual input controls their behaviour. The box jellyfish propels itself through the water by discrete swim pulses governed by a swim pacemaker system, and A. Garm and S. Mori (pp. 3951-3960) have examined how visual input affects the pacemaker. The results revealed a complex control system involving three of the four eye types plus extraocular photoreceptors. This strongly indicates that advanced processing and integration takes place in the jellyfish central nervous system. Photo by J. Bielecki.