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New tricks from old dogs - surprises from optically pumped alkali-metal atoms

We will summarize new, clock-related physics of optically-pumped alkali-metal atoms in buffer gases. The topics will include: the near elimination of spin-exchange broadening for high-spin resonances, the much smaller buffer-gas broadening of the widths of clock transitions than previously believed, push-pull pumping for making nearly pure superposition states for the 0-0 atomic clock transition, and the use of push-pull pumping to induce spontaneous modulation of diode lasers at the 0-0 Bohr frequency.