```
class realtime_mutex
{
    std::atomic_flag flag = ATOMIC_FLAG_INIT;

public:
     // Non-blocking try_lock for real-time contexts
     bool try_lock() noexcept
     {
          // First test: cheap read-only check
          if (flag.test (std::memory_order_relaxed))
               return false;  // Already locked

          // Then test-and-set if the first test passed
          return ! flag.test_and_set (std::memory_order_acquire);
     }

     // Blocking lock with test, test-and-set optimization
     void lock() noexcept
     {
          while (true)
          {
               // Optimistically assume the lock is free on the first try
               if (! flag.test_and_set (std::memory_order_acquire))
                    break;  // Successfully acquired the lock

               // Wait for lock to be released without generating cache misses
               while (flag.test (std::memory_order_relaxed))
                    CPU_PAUSE();  // CPU-specific pause instruction
          }
     }

     void unlock() noexcept
     {
          flag.clear (std::memory_order_release);
     }
};
```

https://rigtorp.se/spinlock/

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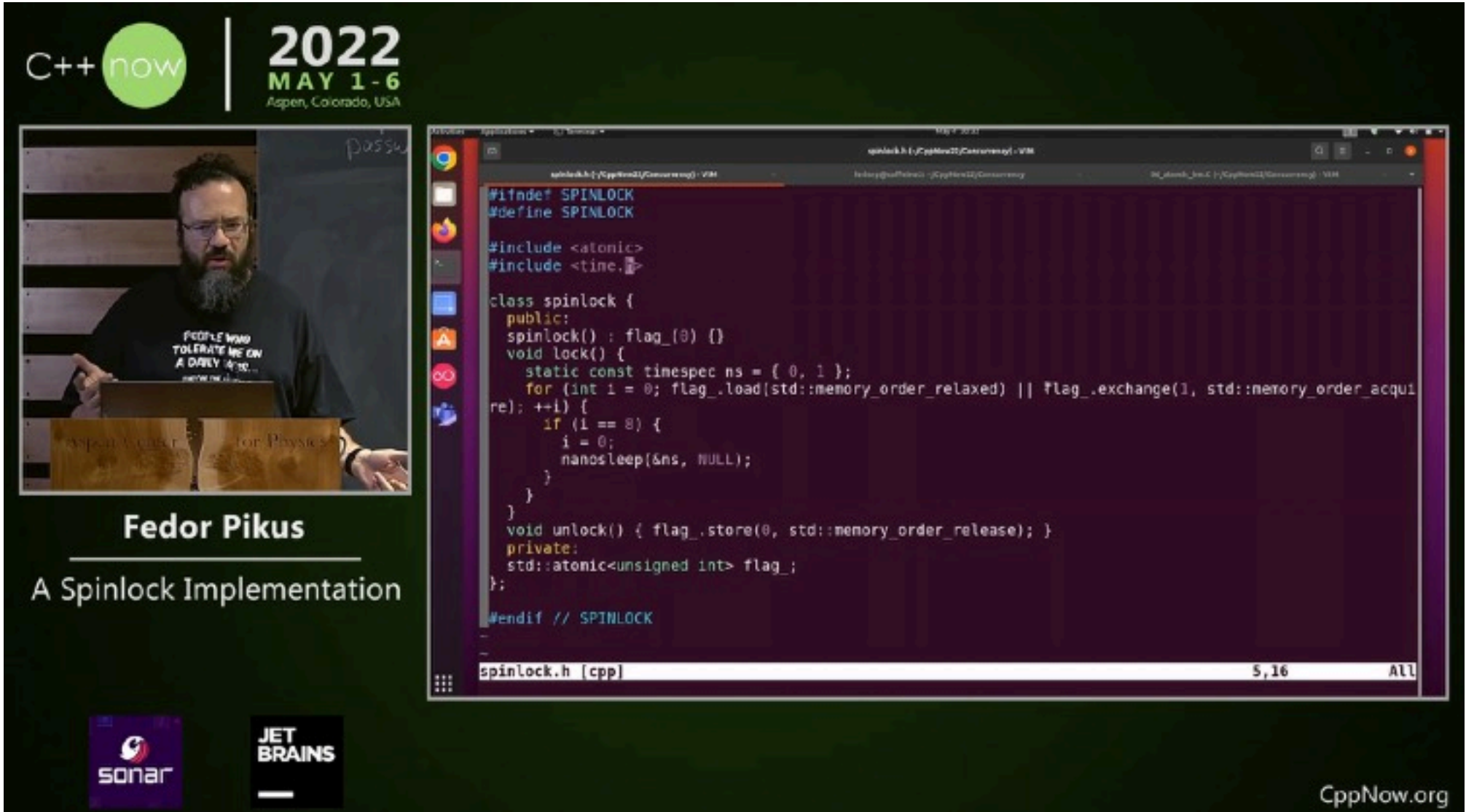

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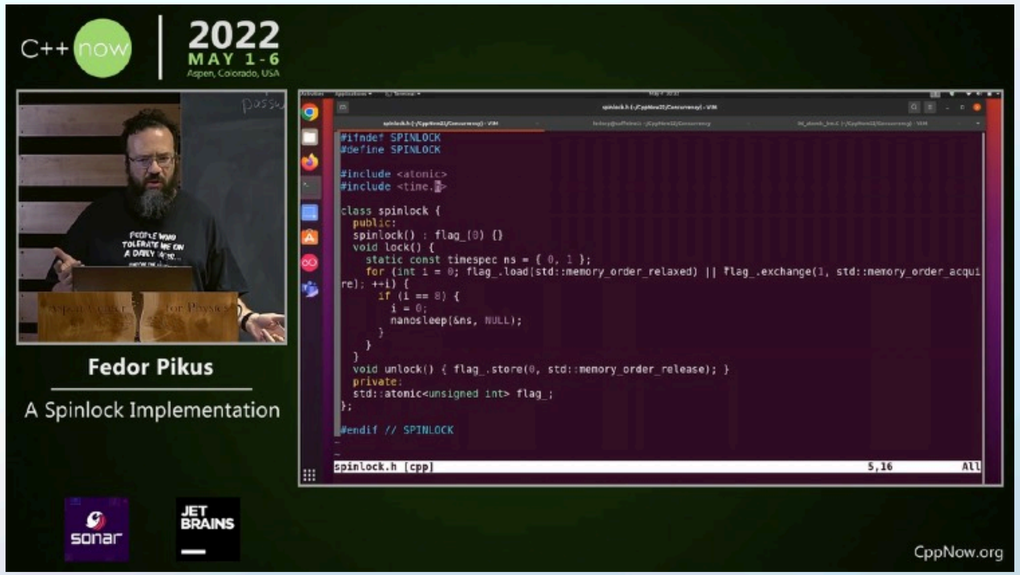

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x0.5